NORTH COAST INTEGRATED REGIONAL WATER MANAGEMENT PLAN

PROPOSITION 84 IMPLEMENTATION GRANT PROPOSAL, ROUND 1

ATTACHMENT 8: WATER QUALITY AND OTHER EXPECTED BENEFITS

Integrated Regional Water Management Program
Applicant: Humboldt County

Attachment 8, Economic Analysis: Water Quality and Other Expected Benefits

I. Introduction

Unlike many areas of California, the North Coast region continues to support natural resource based economies – including commercial fishing, timber harvesting, recreational tourism and agriculture. While some resource-based industry will likely always exist in the region, the economic focus of the region is undergoing transition and becoming increasingly reliant on service-based rather than natural resource based economies. This transition has been and will continue to be difficult for certain sections of the region due to the fact that economic resources are limited and therefore, the ability to construct needed water infrastructure is limited. Additionally, while certain sub-areas within the region are economically stable, much of the North Coast is designated as disadvantaged, and is struggling with legacy environmental challenges as well as facing health risks and water supply reliability issues associated with aging water supply and wastewater infrastructure. Due to limited funding at the county and local levels, all of the jurisdictions within the region face serious challenges to accomplishing statewide water management objectives as well as meeting requirements related to state and federal environmental regulations. The North Coast region has relatively intact watersheds, a still viable though degraded salmon fishery, some of the highest levels of biological diversity in the world, and the North Coast IRWMP process, which is bringing cohesion, a framework for multi-jurisdictional water-related planning, and financial and technical support to a geographically diverse and multi-cultural population. Additionally, the region is a major destination for a large population of people who travel here to enjoy its natural resources and intact watersheds. The NCIRWMP process has made great gains in creating a shared vision for the North Coast and has been successful in obtaining financing for implementation of priority projects, however, lack of funding to implement needed public health and ecosystem restoration projects continues to have substantial implications for the local communities, the region, state and nation.

The planning approach in the North Coast region integrates watershed boundaries with jurisdictional boundaries, thereby addressing environmental issues at the ecosystem, habitat and organism level while responding to the socio-economic needs and policy frameworks of human communities. In addition to having a regional geographic focus that mirrors that of the North Coast hydrologic region as defined by DWR and SWRCB, the North Coast continues this planning organization down to the level of Watershed Management Area (WMA), organizing all projects into this framework and responding to the goals and objectives therein. The WMI Watershed Planning Chapter for the North Coast identifies the following as the highest priority activities for the North Coast WMAs:

- Implementing TMDLs for sediment in 16 coastal watersheds
- Completing all Klamath Basin TMDLs by December 2005
- Maintaining the core regulatory program for regulated dischargers, including stormwater

- Developing a monitoring strategy for the region and integrating SWAMP with TMDL monitoring
- Regulating vineyards and timber activities
- Developing policies for runoff from roads
- Maintaining the groundwater cleanup programs for high priority sites
- Fostering watershed groups and citizen monitoring
- Protecting Critical Coastal Areas
- Promote water recycling activities
- Developing a freshwater beach program with the Sonoma Co. Health Department for the Russian River

The North Coast Integrated Regional Water Management Plan (NCIRWMP) process synchronizes statewide priorities related to environmental and economic viability with regional and local knowledge, relationships, project planning and implementation. The major themes of the NCIRWMP are salmonid recovery, protecting and enhancing the beneficial uses of water, environmental justice, and intra-regional collaboration. Regional and project-level economic analyses in the following pages document the strong emphasis on these themes.

The 19 projects included in this North Coast Integrated Watershed Management Plan (NCIRWMP) application under the Proposition 84 Implementation Grant solicitation reflect the ecologic, economic, and social diversity of the North Coast region (the Region). If funded, the projects would improve the quality and resiliency of the region's water-related ecosystems, thereby improving the quality of life of its human communities. This Attachment presents the water-quality-related and other benefits of the 19 projects.

II. Framework and Methodology

The proposed projects would yield water quality and other related benefits to the extent that they increase the value of goods and services available to Californians. The proposed projects have the potential to increase the value of these goods and services in three ways: by lowering the cost of providing a given supply, by increasing the supply of a given benefit, and by increasing the demand for a given benefit. The projects would produce few goods and services directly; instead, they primarily would enhance the supply of capital necessary to provide goods and services.[11] Thus, the proposed projects would produce benefits to the extent that they increase the region's stock of capital, and the quantity or types of goods and services that flow from it. The proposed projects may also produce benefits to the extent that they affect the demand for, and, hence, the value of certain goods and services.

[11] Economists use the term capital to describe resources commonly used to produce things people value (e.g., different types of goods and services). Classifications vary, but most economists generally recognize five types of capital: natural, human-built, human, social, and financial. Natural capital refers to the components of nature, e.g., water, trees, and soil, and the interactions between these components. Human-built capital refers to water-delivery infrastructure, roads, and other tangible goods and infrastructure. Human capital refers to the knowledge and skills embodied in people. Social capital refers to social networks, cultural norms, laws, and political systems. Financial capital refers to money, sources of credit, and stocks traded in markets.

Many of the proposed projects would produce benefits by affecting, directly and indirectly, the region's stock of natural capital. Natural capital is a term used to describe the inventory of nature's physical building blocks (e.g., trees, water, fish, soil, etc.) and the functional interconnections between the building blocks, which together form ecosystems (Daily 1997). Ecosystems are dynamic systems that support physical, chemical, and biological processes that influence flows, storage, and transformation of matter and energy (Campbell 2009). These "ecosystem processes" contribute to the maintenance and accumulation of the building blocks of natural capital, and in this way, are inextricably interrelated with the concept of natural capital. Some of the projects would affect the region's supply of natural capital and the associated ecosystem processes, for example, by removing an unstable road that deposits sediment into a stream, and replacing it with native vegetation that stabilizes the river bank, thus decreasing sediment deposition.

These changes in natural capital may be quantifiable, but they do not produce economic benefits directly (either quantifiable or unquantifiable). Instead, improvements in natural capital lead to changes in goods and services people value, which are collectively called ecosystem services. Ecosystem services describe the ways in which humans derive value from nature. The proposed projects' direct and indirect effects on natural capital would change the types and quantities of ecosystem services people can derive from the water and related resources of a particular area, and by doing so, produce economic benefits (or costs, if the types or quantities of ecosystem services are diminished). The restoration of the unstable road described above could produce economic benefits by increasing the quality of water in the stream and enhancing the number of salmon available for fishing, improving the quality and quantity of a recreational experience, or reducing the costs associated with treating drinking water downstream.

Figure 1 illustrates a list of ecosystem services. Consistent with widely accepted professional standards and the economic framework outlined above, this list includes a broad suite of services, including those whose value comes from indirect or non-use of resources (U.S. Environmental Protection Agency 2009, National Research Council 2004, U.S. Environmental Protection Agency 2000). The list may expand or contract depending on human preferences over time and across geographic areas. We emphasize that, while natural capital exists everywhere, independent of human society, ecosystem services only exist insofar as there is human demand for their supply, at a particular place and time, and their value reflects the specific context within which the demand exists.

Other economic benefits could arise from a proposed project's effects on the region's supply of human capital (e.g., knowledge and skills embodied in people), by, for example, initiating and supporting education efforts; on its supply of social capital (e.g., social networks and cultural norms), by, for example, supporting planning activities that bring people together to solve problems in constructive and collaborative ways; on its supply of human-built capital, by, for example, initiating the construction or repair of structures; and on its supply of financial capital, by, for example, enhancing the ability of an entity to secure additional sources of funding through loans or grants.

Our estimates of the water quality and other expected benefits each project would generate reflect the marginal, net willingness of Californians to pay, measured in the dollars of 2009, for the goods and services the proposed projects would increase. Economic benefits arising from changes in the supply of some goods and services, especially those derived from natural capital, human capital and social capital, are often difficult to quantify in monetary terms, because they are not traded in markets and cannot be measured using price data and price-dependent techniques. This does not mean that their value is zero.

In some cases, these benefits can be measured using non-market techniques, such as the travel-cost method and the contingent-valuation method. These, and related non-market valuation methods have received considerable scrutiny, and they typically have been tested more rigorously than methods commonly used to estimate the value of water in market settings, such as industrial water use, crop irrigation, and hydropower generation (Young 2005). Non-market valuation techniques generally are cumbersome to implement and, hence, they have not been applied universally to all benefits in all locations. Therefore, in most cases, to estimate the value of non-market benefits, we typically must apply to this region values that were estimated elsewhere.

Figure 1. Illustrative List of Ecosystem Services

	Functions	Examples of Services Produced
1	Production and regulation of water	Natural and human-built features of an ecosystem capture precipitation; filter, retain, and store water; regulate levels and timing of runoff and stream flows; and influence drainage.
2	Formation & retention of soil	Wetlands and biota accumulate organic matter, and prevent erosion to help maintain productivity of soils.
3	Regulation of atmosphere & climate	Biota produce oxygen, and help maintain good air quality and a favorable climate for human habitation, health, and cultivation.
4	Regulation of disturbances	Wetlands and reservoirs reduce economic flood damage by storing flood waters, reducing flood height, and slowing a flood's velocity.
5	Regulation of nutrients and pollution	Wetlands and riparian vegetation improve water quality by trapping pollutants before they reach streams and aquifers; natural processes improve water quality by removing pollutants from streams.
6	Provision of habitat	Wetlands, riparian vegetation, streams, and reservoirs provide habitat for economically important fish and wildlife.
7	Food production	Biota convert solar energy into plants and animals edible by humans.
8	Production of raw materials	Streams and biota generate materials for construction, fuel, and fodder; streams possess energy convertible to electricity.
9	Pollination	Insects facilitate pollination of economically important wild plants and agricultural crops.
10	Biological control	Water-related birds and microorganisms control pests and diseases.
11	Production of genetic & medicinal resources	Genetic material in wild plants and animals provide potential basis for drugs and pharmaceuticals.
12	Production of ornamental resources	Products from water-related plants and animals provide materials for handicraft, jewelry, worship, decoration, and souvenirs.
13	Production of aesthetic resources	Wetlands, riparian vegetation, streams, and reservoirs provide basis for enjoyment of scenery from roads, housing, parks, trails, etc.
14	Production of recreational resources	Streams, reservoirs, riparian vegetation, fish, waterfowl, and other wildlife provide basis for outdoor sports, eco-tourism, etc.
15	Production of spiritual, historic, cultural, and artistic resources	Wetlands, riparian vegetation, streams, and reservoirs serve as basis for spiritual renewal, focus of folklore, symbols of group identity, motif for advertising, etc.
16	Production of scientific and educational resources	Wetlands, riparian vegetation, streams, and reservoirs provide inputs for research and focus for on-site education.

Transferring estimates of value from one location to another inherently generates questions regarding the reliability of the results. Several factors, however, provide reassurance that we have not overestimated the value of the expected benefits. We have followed transfer guidelines expressed by the U.S. Environmental Protection Agency (2000). Insofar as possible, whenever project-specific estimates of value are not available, we have strived to identify estimates from settings with similar economic characteristics, and especially those from nearby watersheds or from within California. Moreover, although we anticipate that the real value of ecosystem goods and services, such as high-quality water in streams, healthy riparian forests, and robust salmon populations, will increase over

time, all else equal, we lack defensible forecasts of the rates of increase and, hence, have not folded these increases into our estimates.

Another factor that suggests our estimates of value probably are less than the true value stems from the geographic scope of most of the studies on which we rely. Nearly all the non-market estimates of value we employ were developed using techniques that focused on a subset of the relevant population. Estimates based on surveys of households, for example, often sought to determine the value that households in the surrounding area place on a particular environmental resource and overlooked the value that households further away place on it. Such techniques can seriously underestimate the true value of environmental amenities in the North Coast Region, insofar as this region's natural resources are economically important to households living far away. Moreover, recent research has found that a significant percentage of the total economic benefit households derive from areas such as this materialize in distant metropolitan areas (Schmidt and Courant 2006). In this instance, much of the economic benefit that would be produced by projects that propose to protect or enhance the environment of the North Coast Region would materialize to households outside the region, especially to residents of the state's major metropolitan areas. By deriving our estimates of benefits from past studies that often overlooked these distance effects, we have unavoidably failed to capture this distance-related component of value.

Our estimates of environmental benefits further underestimate the true value insofar as the studies on which we base the estimates have examined the value of specific ecosystem goods and services in isolation, overlooking the cumulative value provided to human society by the ecosystem as a whole. Both ecologists and economists have recognized the importance of the integrated, composite workings of ecosystems, but both disciplines have yet to develop reliable techniques for describing, let alone measuring their value (Millennium Ecosystem Assessment 2005). In effect, then, our estimates give only a partial view of the total value of improvements in environmental quality.

To further buttress our belief that our non-market estimates of value probably underestimate the true value of the potential benefits from protecting and enhancing the environment, we turn to the National Research Council's review of methods for valuing the goods and services produced by water-related ecosystems. Based on its assessment, the report concluded,

> "**There is a much greater danger of underestimating the value of ecosystem goods and services than over-estimating their value**. Under-estimation stems primarily from the failure to include in the value estimates all of the affected goods and services and/or all of the sources of value, or from use of a valuation method that provides only a lower bound estimate of value. In many cases, this reflects the limitations of the available valuation methods. Over-estimation, on the other hand, can stem from double-counting or from possible biases in valuation methods. However, it is likely that in most applications the errors from omission of relevant components of value will exceed the errors from over-estimation of the components that are included (National Research Council 2004, p. 242)."

We believe this conclusion applies in this instance: the likelihood that we have underestimated the benefits of the proposed projects is far greater than the likelihood that we have overestimated them.

Similar to the process described in Attachment 7 for water supply benefits, to estimate water quality-related other expected benefits, we:

- Worked with each project sponsor, using a with-vs.-without framework, to describe the expected outcome of each project in terms of the expected net increase in the supply of different types of goods and services, the avoided costs of project-related activities, and/or the change in the demand for water supply-related goods and services.
- Reviewed the existing economic literature to identify relevant studies that identify the marginal value to Californians of each type of good and service.
- Selected from the existing literature, where appropriate, a reasonable estimate of the per-unit marginal value of each good or service. In completing this step, we first sought studies that directly measure the marginal value of the specific good or service whose supply the project would increase. If such a study were not available, we then sought studies that measure the marginal value of a good or service similar in terms of geographic location, environmental context, and economic context. In all instances we sought studies that have been peer reviewed.
- Adjusted each estimate of per-unit value of a good or service or avoided cost to its equivalent value in 2009 dollars, using the update factors provided in Table 10 of the *Proposition 84 IRWM Implementation Proposal Solicitation Package.* For the years 1997 to 2001, we used the update factors provided by the Department of Water Resources in the *Frequently Asked Questions: Proposition 84 Implementation Grant Program (Round 1)* document, released December 3, 2010.
- Estimated the annual value of the expected increase in the supply of each type of good or service by multiplying the expected annual increase in the supply times the per-unit value, in 2009 dollars.
- Assessed the uncertainty embodied in each estimate of annual value for each type of good or service, and determined if it is reasonable to conclude that it offers an unbiased representation of the true value of the good or service. Where appropriate, we selected an estimate of per-unit value that more likely than not yields an *underestimate of the true value* of a project's benefits.
- Completed an internal-review process, to ensure the information we provide gives a reasonable description of the costs and benefits for each project and for the NCIRWMP Proposal as a whole. Participants in the internal-review process included representatives for each project, economic and environmental consultants, the North Coast Regional Partnership's Technical Peer Review Committee, and staff to the NCIRWMP.

The regional water quality benefits and other benefits of the proposal, as a whole, are described in Section III, below. The water quality benefits and other benefits of each project are described in detail in Section IV, below. Many of the projects would produce similar types of benefits. To avoid redundancy, where possible, we have included a complete discussion of the assumptions, sources, and factors contributing to uncertainty for particular economic benefits in the regional costs and benefits section, and referred to it in the discussion of each project-level benefit. Each project-level narrative contains a basic description of each benefit it would produce, which outlines the mechanisms, level of effects, and sources of uncertainty specific to each project. To ensure consistency across similar benefits for each project, the benefit descriptions share similar language from project to project. While this contributes some redundancy to the overall narrative, it is necessary to ensure each project's benefits are described completely.

III. Narrative Description: Regional Benefits

This section presents the total value of water quality and other expected benefits the suite of projects proposed for the North Coast region would generate. In it, we also describe the methodologies and assumptions we use to estimate the project-level benefits, where economic quantification was possible. For each regional-level benefit, we describe sources of uncertainty and how the uncertainty might influence the direction and magnitude of the benefit or cost.

The present value of the regional water quality and other expected benefits for all projects proposed for the North Coast region totals $21,889,074 in 2009 dollars, discounted at a rate of 6 percent per year. This value includes the benefits generated from a wide variety of impacts related to water quality. The benefits are calculated for each project in a series of Table 16s provided at the end of this Attachment.

A. Water-Quality Benefits

1. Avoided Cost of Sediment Deposition (Quantifiable and Unquantifiable)

Eleven projects would reduce the amount of sediment entering the region's waterways by more than 136,000 tons over the lifespan of the projects:

- 402–Ackerman Creek Habitat Restoration, Pinoleville Pomo Nation
- 345–Bodega Bay Water Resources Management Project, Gold Ridge Resource Conservation District
- 292–Lower Russian River Water Quality Improvement Project, Sotoyome Resource Conservation District
- 364–Mendocino Jumpstart Integrated Water Plan, Mendocino County Water Agency/ Planning Department
- 396–Copeland Creek Watershed Detention/Recharge, Habitat Restoration, and Steelhead Refugia Project, Sonoma County Water Agency

- 289–Camp Creek Habitat Protection-Road Decommissioning Implementation Project, Karuk Tribe
- 352–Gualala River Sediment Reduction Program, Gualala River Watershed Council
- 444–Mattole Integrated Watershed Management Initiative, Mattole Restoration Council
- 441–Waterfall Gulch Transmission Main Project, City of Fort Bragg
- 358–Mendocino Headwaters Integrated Water Quality Enhancement Project, Mendocino County RCD
- 357–Highway 96 Stormceptor, Willow Creek Community Services District

For some projects, data were unavailable to quantify the specific amount of sediment deposition that would be reduced, although data from other, similar projects suggest that the amount of sediment entering waterways would almost certainly decline. The benefits resulting from sediment reduction occur from the point of potential erosion, downstream, and into near-shore and offshore marine environments. For some projects, sponsors have estimated expected annual reductions in sediment deposition. For others, the sponsors have estimated the total reduction in sediment deposition that would result from the project and we assumed, based on information provided by project sponsors, that the reductions would occur linearly over a period of 10 years.

For two projects, sponsors directly estimated the long-term maintenance costs they would avoid by stabilizing sediment through the project, and we employed their estimates to directly value the sediment-related benefit. For the other projects that quantified the tons of sediment the projects would remove, we employed a per-ton value to estimate the benefits of sediment-removal activities. Economic studies have examined and monetized some of the benefits that materialize when excessive sediment does not impair streams, rivers, estuaries, and the marine environment. A study conducted by the U.S. Department of Agriculture (Hansen and Ribaudo 2008) identified 13 types of benefits associated with decreasing sediment. For each benefit, the researchers modeled the potential value associated with reducing sediment, per ton, for each county across the country. For our analysis, we apply the average value for the counties in the region, $11.28 per ton, to estimate the benefits derived from the prevention of sediment deposition. Included in this value are the regional benefits associated with the impacts of sediment on:

- Water-based recreation – cleaner fresh water recreation
- Irrigation ditches and channels – reduced cost of removing sediment and aquatic plants from irrigation channels
- Road drainage ditches – less damage to and flooding of roads
- Municipal water treatment – lower sediment-removal costs for water treatment plants
- Flood damage – reduced flooding and damage from flooding

- Marine fisheries – improved catch rates for marine commercial fisheries
- Marine recreational fishing – improved catch rates for marine recreational fishing
- Municipal and industrial water use – reduced damages from salts and minerals dissolved from sediment
- Steam power plants – reduced plant growth on heat exchangers
- Soil productivity – reduced losses in soil productivity
- Dust cleaning – decrease in cleaning due to reduced wind-borne particulates.
- Reservoir services – less sediment in reservoirs
- Navigation – shipping industry avoidance of damages from groundings

At least three major factors suggest that the value we derive from Hansen and Ribaudo (2008) underestimates the true value of the sediment-reduction benefits. First, the value does not reflect many potential benefits, such as the goods and services derived from potential impacts on wetlands and endangered species. Second, the estimates of sediment erosion that the projects would reduce are based on current sediment erosion rates. Climate change is expected to increase the frequency and intensity of storm events, which would likely increase the rate of sediment erosion (Masden and Figdor 2007) absent the proposed projects. If future sediment erosion rates exceed current rates, the without-project sediment erosion is likely to increase, and thus, the expected benefit of each project's sediment control activities is likely to be an underestimate. Third, this estimate does not anticipate increases in value that occur over time. We anticipate that the value of sediment-reduction benefits will increase, relative to the general price index, but have not accounted for this increase in our calculations.

The benefits listed above explicitly do not include the passive-use values associated with improvements in salmon populations or salmonid habitat arising from sediment-reduction activities. We capture these values in the *Passive-Use Value Associated with Increases in Salmonid Populations* and *Cultural Value Associated with Increases in Salmon Populations* benefits, described below.

Using the estimated tons of sediment removed by the projects and the per-ton value described above, we estimate that the total present value of this benefit at the regional level, in 2009 dollars discounted at 6 percent per year, over a period of 50 years, is $735,727.

2. Passive-Use Value Associated with Increases in Salmonid Populations (Quantifiable and Unquantifiable)

Seventeen projects would enhance salmonid habitat and, in some cases, increase salmonid populations in the North Coast region's waterways and in nearshore and offshore marine areas:

- 402–Ackerman Creek Habitat Restoration, Pinoleville Pomo Nation

- 345–Bodega Bay Water Resources Management Project, Gold Ridge Resource Conservation District
- 292–Lower Russian River Water Quality Improvement Project, Sotoyome Resource Conservation District
- 364–Mendocino Jumpstart Integrated Water Plan, Mendocino County Water Agency/ Planning Department
- 374-6–Nissah-Kah Creek Fish Passage, Hopland Band of Pomo Indians
- 393–Russian River *Arundo donax* Removal and Riparian Enhancement Program, Sotoyome Resource Conservation District
- 396–Copeland Creek Watershed Detention/Recharge, Habitat Restoration, and Steelhead Refugia Project, Sonoma County Water Agency
- 289–Camp Creek Habitat Protection-Road Decommissioning Implementation Project, Karuk Tribe
- 311–Indian Creek Sewer Pipeline Crossing, Happy Camp Sanitary District
- 408–Del Norte Agricultural Enhancement Program, Del Norte Resource Conservation District
- 352–Gualala River Sediment Reduction Program, Gualala River Watershed Council
- 444–Mattole Integrated Watershed Management Initiative, Mattole Restoration Council
- 355–Real-Time Weather Data for Irrigation Water Management, Del Norte Resoruce Conservation District
- 441–Waterfall Gulch Transmission Main Project, City of Fort Bragg
- 358–Mendocino Headwaters Integrated Water Quality Enhancement Project, Mendocino County RCD
- 405–Sustainable Forests, Clean Water and Carbon Sequestration Demonstration Project, Redwood Forest Foundation, Inc.
- 357–Highway 96 Stormceptor, Willow Creek Community Services District

For two projects, sufficient data were available to estimate an increase in the number of salmonids directly arising from improvements in habitat. Once they achieve completion, these projects would produce 776 additional adult salmonids each year, primarily coho and steelhead. For most projects, however, quantifiable estimates of population increases were not possible, although evidence from other, similar, projects, suggests that tangible benefits to the region's salmon populations would be likely to occur.

Individuals derive value from increases in salmonid populations in two ways: some (e.g., recreational anglers and commercial fishermen) directly interact with salmon populations and derive benefit by

catching and consuming the fish, others (including some from the former group) derive value from the salmon solely based on the salmon's existence. Studies have shown that regardless of direct interaction with salmon populations, many Californians hold a positive willingness to pay to ensure the long-term survival of salmon (Loomis 2006).

Several studies have attempted to estimate the passive use value of increases in salmonid populations among households in California and neighboring states. Passive use value, in this case, refers to the benefit individuals derive from knowing that healthy salmonid populations exist, regardless of their intent to directly interact with salmon and steelhead through fishing or some other means. In general, these studies have estimated households' average willingness to pay to implement policies that would increase salmon populations. At the per salmon level, these studies reveal that households are willing to pay only fractions of a penny for increases in salmon populations. When summed across a region, however, the total value Californians are willing to pay for increases in salmon populations can become several thousands of dollars per fish. With about 11.5 million households in California, four studies that have estimated willingness to pay values for increases in salmon populations suggest that Californians, in total, would be willing to pay these values per fish per year: $424 (Olsen Richards and Scott 1991), $2,481 (Layton, Brown, and Plummer 1999), $3,563 (Loomis 1996), and $7,910 (Bell, Huppert, and Johnson 2003). In eliciting willingness to pay estimates from respondents, these studies told respondents that hypothetical policies would increase salmon populations by 2.5 million, 2.5 million, 300,000, and 165,000, respectively.

The studies agree that respondents' willingness to pay per fish for an increase in salmon populations decreases as the hypothetical increase in salmon stocks increases. In other words, the smaller the increase in salmon populations, the higher the willingness to pay, per fish. The proposed projects would yield small potential increases in salmon populations, relative to the size of existing populations, and to the hypothetical increases posited in the valuation studies. Hence, the value per additional fish resulting from the proposed projects likely will resemble the upper end of the range of estimates rather than the lower end. Nonetheless, to address concerns about not overestimating the benefits, we employ a value of $2,000 per additional fish per year as a rough estimate of the benefit of those projects that would increase salmon populations.

Using the estimated increase in number of salmon the projects that were able to quantify changes in salmonid populations would generate, and the per-salmon value described above, we estimate that the total present value of this potential benefit at the regional level, in 2009 dollars discounted at 6 percent per year, over a period of 50 years, is $17,255,388.

3. Cultural Value Associated with Increases in Salmonid Populations (Unquantifiable)

As described in the discussion of the preceding benefit, fourteen projects would enhance salmonid habitat and, in some cases, increase salmonid populations in the North Coast region's waterways and in near-shore and off-shore marine areas. The Native American tribes of Northern California have a special relationship with salmon, relying on the fish for subsistence, cultural identity, and spiritual significance (Kass 2009).

Unlike many Californians who ascribe a monetary willingness to pay to protect salmon, even if they never intend to directly fish or watch them, many Native Americans recognize the importance of salmon outside the cultural framework and economic terms western society often imposes (Malloy 1992). Accordingly, they reject the validity of applying a dollar value to fish that constitute a core element of their cultural and spiritual well-being. For this reason, we recognize the cultural significance that arises from the projects' improvements to salmonid populations and their habitat apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include members of Native American tribes – both within and outside of the region – who believe the continued existence of salmonid populations and their habitat is essential to cultural and spiritual well-being.

4. Increased Quality and Quantity of Recreation (Quantifiable and Unquantifiable)

Six projects would directly increase the quantity and/or quality of recreation in North Coast region's waterways and adjacent riparian and upland areas:

- 402–Ackerman Creek Habitat Restoration, Pinoleville Pomo Nation
- 292–Lower Russian River Water Quality Improvement Project, Sotoyome Resource Conservation District
- 364–Mendocino Jumpstart Integrated Water Plan, Mendocino County Water Agency/ Planning Department
- 311–Indian Creek Sewer Pipeline Crossing, Happy Camp Sanitary District
- 408–Del Norte Agricultural Enhancement Program, Del Norte Resource Conservation District
- 444–Mattole Integrated Watershed Management Initiative, Mattole Restoration Council

With the exception of the Mendocino Jumpstart Integrated Water Plan, data are insufficient to quantify the specific increase in quantity or quality of recreation arising from improvements in aquatic and forest ecosystems generated by the projects. Despite the lack of quantifiable increases in quantity or quality of recreation, however, evidence from other, similar, projects suggests that the effects the projects would have on water quality or other inputs to recreation would, in fact, produce quantifiable recreation-related benefits.[12]

A recreational activity is valuable insofar as individuals are willing to pay to participate in it. In most cases, individuals typically would be willing to pay some greater sum of money to participate in a recreation activity than they actually pay. The difference between the amount they would be willing

[12] Many of the other projects included in this proposal would have the potential to indirectly increase the quantity and quality of recreation, by enhancing water quality, riparian or forest habitat, or other natural resources. The linkages between the project and specific recreational opportunities, however, were not direct enough to describe, so we do not include them in this list.

to pay and the amount they actually pay is called consumer surplus. Table 2.1 contains some illustrative examples of consumer surplus values associated with a variety of recreation activities.

Table 2.1. Consumer Surplus Associated with Recreation Activities ($/user/day)

Activity	Pacific Coast Mean
Camping	$108.70
Picnicking	$66.90
Swimming	$28.43
Sightseeing	$63.30
Hiking	$33.39
Fishing	$46.21
Wildlife viewing	$37.18
General recreation	$27.84

Source: Rosenberger, R., and J. Loomis. 2001. *Benefit Transfer of Outdoor Recreation Use Values: A Technical Document Supporting the Forest Service Strategic Plan (2000 Revision)*. General Technical Report: RMRS-GTR-72. U.S. Department of Agriculture, Forest Service.

Increasing the quality of recreation would, all else equal, increase the consumer surplus derived by individuals participating in the activity and, thus, increase the total benefit derived from the activities. Similarly, increasing the quantity of recreational activities, all else equal, increases the total number of recreation days experienced, also increasing the total benefit derived from the activities. While data are insufficient to estimate the potential change in quality or quantity of recreation that would result from the proposed projects, research supports the notion that the projects are likely to yield non-trivial recreation benefits.

Beneficiaries of this benefit would include individuals that participate in recreation in the area as well as businesses that provide goods and services associated with recreation in the area.

5. Potential Increased Quality of Drinking Water (Unquantifiable)

Three projects would potentially increase the quality of drinking water for residents in the North Coast region:

- 292–Lower Russian River Water Quality Improvement Project, Sotoyome Resource Conservation District
- 306–Water Treatment System Upgrade, Happy Camp Community Services District
- 441–Waterfall Gulch Transmission Main Project, City of Fort Bragg

The Lower Russian River Water Quality Improvement Project would improve drinking water by removing toxic pollutants and pathogens that the U.S. EPA and California Department of Public Health have identified as drinking-water contaminants. The remaining projects would improve the

quality of drinking water by replacing existing equipment that no longer meets state and federal drinking water treatment standards.

Potential beneficiaries of this benefit would include people who obtain their drinking water from the water sources the projects would affect, and the drinking-water-system operators and ratepayers.

6. Avoided Water-Treatment and Non-Compliance Costs (Quantifiable and Unquantifiable)

Three projects would produce water-quality-related benefits by reducing water treatment and water-quality compliance costs for project sponsors and other downstream water users:

- 364–Mendocino Jumpstart Integrated Water Plan, Mendocino County Water Agency/ Planning Department, which would allow downstream water users to avoid water-treatment and compliance costs.
- 306–Water Treatment System Upgrade, Happy Camp Community Services District, which would avoid costs associated with non-compliance with state and federal drinking-water regulations.
- 408–Del Norte Agricultural Enhancement Program, Del Norte Resource Conservation District, which would allow both project sponsors and downstream water users avoid water-treatment and water-quality regulation compliance costs.

Based on the costs and assumptions we describe for each project benefit in Section IV, we estimate that the total present value of these potential water quality benefits at the regional level, in 2009 dollars discounted at 6 percent per year, over a period of 50 years, is $83,105.

7. Reduced Operations and Replacement Costs (Quantifiable and Unquantifiable)

Two projects would produce water-quality-related benefits by reducing replacement costs for water-treatment equipment and reducing operation, maintenance, and monitoring costs:

- 358–Mendocino Headwaters Integrated Water Quality Enhancement Project, Mendocino County RCD, which would generate water-quality benefits that would lower its current water-system monitoring and maintenance costs.
- 357–Highway 96 Stormceptor, Willow Creek Community Services District, which would generate water quality improvements that would extend the expected lifespan of its drinking-water filtration system.

Based on the costs and assumptions we describe for each project benefit in Section IV, we estimate that the total present value of these potential water quality-related benefits at the regional level, in 2009 dollars discounted at 6 percent per year, over a period of 50 years, is $148,580.

B. Other Expected Benefits

1. Avoided Cost of Carbon Dioxide Emissions

Six projects would sequester over 20,000 tons of carbon dioxide over the next 50 years:

- 345–Bodega Bay Water Resources Management Project, Gold Ridge Resource Conservation District
- 402–Ackerman Creek Habitat Restoration, Pinoleville Pomo Nation
- 393–Russian River *Arundo donax* Removal and Riparian Enhancement Program, Sotoyome Resource Conservation District
- 396–Copeland Creek Watershed Detention/Recharge, Habitat Restoration, and Steelhead Refugia Project, Sonoma County Water Agency
- 444–Mattole Integrated Watershed Management Initiative, Mattole Restoration Council
- 405–Sustainable Forests, Clean Water and Carbon Sequestration Demonstration Project, Redwood Forest Foundation, Inc.

The International Panel on Climate Change has identified anthropogenic greenhouse gas emissions as the main contributor of global warming and climate change. Carbon dioxide emissions have received the most attention as they account for the majority of these emissions – 77 percent in 2004 (Intergovernmental Panel on Climate Change 2007). Expected impacts of climate change include decreased ecosystem resilience, increased extinction rates, fluctuations in cropland productivity, increased erosion and flooding in coastal areas, and decreased availability of clean drinking water. These impacts could result in the displacement of hundreds of millions of people, increased morbidity, and irreversible damages to critical life-support systems within the environment (Intergovernmental Panel on Climate Change 2007).

Numerous researchers have evaluated the potential impacts associated with climate change and have estimated the value of the social costs associated with carbon dioxide emissions. In 2009, a report submitted to the California Climate Change Center suggested that the social cost of carbon dioxide emissions is $7.18 to $57.79 per ton of carbon dioxide (Shaw et al. 2009). The low estimate in the range presented by the California report is similar to, and in some cases lower than, prices for carbon dioxide emissions in regulatory and voluntary markets across the world. Markets, in general, fail to incorporate all external costs and benefits associated with the goods and services they trade, and, hence, the low end of this range is likely an underestimate of the full social cost of carbon dioxide emissions. For our analysis, we use a middle value of $32.49 per ton of carbon dioxide to estimate the social cost of carbon dioxide emissions. Furthermore, we assume that this value increases, in real terms, by 2.5 percent per year, to fold in expectations the value of the social costs would increase at an annual rate of 2 to 3 percent as climate-change related damages mount (Nordhaus 2008).

We apply this value to projects that provide more carbon dioxide sequestration than would occur without them. These projects typically would involve establishment of riparian and other forest habitat. To estimate the total value of carbon dioxide sequestered by each of these projects, we first estimate the amount of carbon dioxide sequestered by the project relative to what would occur without it. The U.S. Department of Energy developed technical guidelines for estimating sequestration rates, regionally, across the country (U.S. Department of Energy, Office of Policy and International Affairs 2006). The average sequestration rate for California forests in their first year of growth is 2.83 tons of carbon dioxide per acre. This figure fluctuates as the trees age, and ranges from 1.9 to 4.5 tons of carbon dioxide per acre per year over a period of 100 years. In our analysis, we assume that riparian and other forest replanting efforts would achieve these rates of carbon dioxide sequestration, but that the existing vegetation without restoration would have sequestered half the amount of carbon dioxide as the project-related vegetation. In other words, we assume that replanting riparian and other forest habitat would increase sequestration rates by between 1.0 to 2.3 tons of carbon dioxide, per acre, per year, depending on the age of the vegetation.

Using the estimated tons of carbon dioxide sequestered by the projects and the per-ton value of carbon dioxide sequestration described above, we estimate that the total present value of this benefit at the regional level, in 2009 dollars discounted at 6 percent per year, over a period of 50 years, is $271,493.

2. Passive-Use Value of Increases in Forest Biodiversity (Quantifiable)

Eight projects would restore almost 300 acres of riparian and upland forest habitat:

- 289–Camp Creek Habitat Protection-Road Decommissioning Implementation Project, Karuk Tribe
- 345–Bodega Bay Water Resources Management Project, Gold Ridge Resource Conservation District
- 358–Mendocino Headwaters Integrated Water Quality Enhancement Project, Mendocino County RCD
- 364–Mendocino Jumpstart Integrated Water Plan, Mendocino County Water Agency/ Planning Department
- 393–Russian River *Arundo donax* Removal and Riparian Enhancement Program, Sotoyome Resource Conservation District
- 396–Copeland Creek Watershed Detention/Recharge, Habitat Restoration, and Steelhead Refugia Project, Sonoma County Water Agency
- 402–Ackerman Creek Habitat Restoration, Pinoleville Pomo Nation
- 444–Mattole Integrated Watershed Management Initiative, Mattole Restoration Council

For most of the projects, these restoration efforts involve removing invasive plant species and planting native vegetation such as trees, shrubs, and grasses to improve riparian and forest function. Improvements in riparian and forest function derived from restoration efforts are valuable to two distinct groups of stakeholders: those that directly interact with these habitats (e.g., hikers, anglers, hunters, birdwatchers) and derive benefit from recreation in the area or from consuming goods generated in the area, and those that do not directly interact with the restored areas but nonetheless derive value from the restoration solely based on the forest's existence. Studies have shown that this latter group of stakeholders holds a positive willingness to pay to ensure the riparian and forest function.

In 2009, researchers conducted several meta-analyses estimating various use and nonuse values associated with forestland. In estimating the passive use value of forestland, the researchers compiled data from 23 relevant studies (Chiabai et al. 2009). Their results identify per-acre estimates for passive use values by geographic region and forest biome. For our analysis, we use the passive use value associated with North American forestland in the cool coniferous biome, $120 per acre per year.

The value described above estimates society's total willingness to pay for fully-restored forest land in cool coniferous forests in North America. Insofar as this estimate considers only passive use values, it likely underestimates the total economic value of riparian and other forest-based restoration because direct users of the restored habitat likely are willing to pay more for its restoration. It also likely underestimates the value because, as human populations and incomes grow in California, the marginal value of forest land probably will increase, as will the value of restoration efforts. Because we found no reliable estimate of the rate of increase, we did not fold this increase into our estimates. For these reasons, it seems reasonable to conclude that the value estimates derived in the past underestimate, perhaps substantially, the true value of future increases in fully-restored riparian and other forest habitat.

Using the estimated acres of riparian and other forestland restored by the projects and the per-acre value described above, we estimate that the total present value of this benefit at the regional level, in 2009 dollars discounted at 6 percent per year, over a period of 50 years, would be $423,549.

3. Cultural Value Associated with Increases in Forest Biodiversity (Unquantifiable)

As described in the discussion of the preceding benefit, eight projects would restore almost 300 acres of riparian and upland forest habitat primarily by removing invasive plants and planting native vegetation such as trees, shrubs, and grasses. These native plants, and the native wildlife populations they support, would have a greater utility for Native American tribes than the existing, non-native ecological resources. Many native plants and wildlife have cultural significance to local tribes who use them for their edible, medicinal, functional, and spiritual properties.

Unlike many Californians who ascribe a monetary willingness to pay to restore native forests and increase ecological biodiversity, many Native Americans recognize the importance of restoring this

native biodiversity outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we identify the cultural significance that arises from the projects' restoration of forest ecosystems apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include members of local Native American tribes in the region who believe the continued existence of native, culturally-important plant and animal species is essential to cultural and spiritual well-being.

4. Enhanced Human and Social Capital (Unquantifiable)

Five projects[13] include activities in which volunteers, project participants, or others in the community connect with each other in workshops, forums, or committees, or participate in an educational experience:

- 402–Ackerman Creek Habitat Restoration, Pinoleville Pomo Nation
- 345–Bodega Bay Water Resources Management Project, Gold Ridge Resource Conservation District
- 364–Mendocino Jumpstart Integrated Water Plan, Mendocino County Water Agency/ Planning Department
- 396–Copeland Creek Watershed Detention/Recharge, Habitat Restoration, and Steelhead Refugia Project, Sonoma County Water Agency
- 352–Gualala River Sediment Reduction Program, Gualala River Watershed Council

These experiences would increase the human and social capital in the region insofar as they educate the local population and/or build social ties within the community. Human and social capital are valuable in that they enhance the capacity of community members to engage in and complete future projects. Data are unavailable to quantify the economic benefits arising from these effects, but they could lead to lower costs of management for local, state, and federal agencies and land owners, and the production of additional water quality and salmonid-related benefits. The beneficiaries of this benefit would include volunteers, project participants, and others in the community that participate or are exposed to the project as well as the communities within which they reside.

5. Other Avoided Costs (Quantifiable)

Two projects would avoid the costs associated with regulatory and legal actions and penalties:

[13] Many of the other projects included in this proposal could have the potential to enhance human and social capital in the region. The mechanisms by which they would do this, however, were not direct enough to describe, so we do not include them in this list.

- 311–Indian Creek Sewer Pipeline Crossing, Happy Camp Sanitary District, which would potentially avoided costs associated with Administrative Civil Liability Action fines
- 444–Mattole Integrated Watershed Management Initiative, Mattole Restoration Council, which would potentially avoid costs associated with a basin-wide water adjudication

Two projects would avoid the costs associated with an earthquake, flood, or fire:

- 311–Indian Creek Sewer Pipeline Crossing, Happy Camp Sanitary District, which would potentially avoid costs of emergency repairs.
- 362–Blue Lake Fieldbrook Pipeline Support Retrofit Project, Humboldt Bay Municipal Water District, which would potentially avoid damage from fire.

Based on the costs and assumptions we describe for each project benefit in Section IV, we estimate that the total present value of avoiding these costs at the regional level, in 2009 dollars discounted at 6 percent per year, over a period of 50 years, is $1,580,317.

6. Other Unquantifiable Benefits

Several projects would avoid these additional unquantifiable benefits:

- Improved Reliability of Road Access and Access for Emergency Response Vehicles (292–Lower Russian River Water Quality Improvement Project, Sotoyome Resource Conservation District)
- Value of Decrease in Likelihood of Catastrophic Fire Event (393–Russian River *Arundo donax* Removal and Riparian Enhancement Program, Sotoyome Resource Conservation District and 405–Sustainable Forests, Clean Water and Carbon Sequestration Demonstration Project, Redwood Forest Foundation, Inc.)
- Design and Planning for Future Stormwater Detention Basins (396–Copeland Creek Watershed Detention/Recharge, Habitat Restoration, and Steelhead Refugia Project).
- Reduced Risk of Introduction and Spread of Invasive Species (289–Camp Creek Habitat Protection-Road Decommissioning Implementation Project)
- Potential to Leverage Funds for Additional Sediment Reduction Activities (289–Camp Creek Habitat Protection-Road Decommissioning Implementation Project).
- Avoided Costs of A Service Disruption (311–Indian Creek Sewer Pipeline Crossing, Happy Camp Sanitary District).
- Avoided Costs of Road Maintenance (352–Gualala River Sediment Reduction Program, Gualala River Watershed Council).
- Avoided Cost of Regulatory Enforcement (444–Mattole Integrated Watershed Management Initiative, Mattole Restoration Council)

- Improved Soil Quality (405–Sustainable Forests, Clean Water and Carbon Sequestration Demonstration Project, Redwood Forest Foundation, Inc.).
- Cultural Value Derived from Access to Acorn Harvesting Orchard (405–Sustainable Forests, Clean Water and Carbon Sequestration Demonstration Project, Redwood Forest Foundation, Inc.).

We identify the projects that produce these benefits and describe the uncertainty and assumptions associated with benefit in Section IV.

IV. Narrative Description: Individual Project Benefits

This section includes a narrative description of each project's with and without conditions and the water quality-related and other benefits. Projects are presented alphabetically by Watershed Management Area, in keeping with the intent of the NCIRWMP to utilize watershed based planning.

A. Russian River/Bodega WMA

402–Ackerman Creek Habitat Restoration, Pinoleville Pomo Nation

1. Project Description and Background

The Ackerman Creek Habitat Restoration Project would remove invasive plants from about 0.4 acres of riparian habitat and would plant native vegetation on 4 acres of riparian habitat along 0.63 miles of Ackerman Creek. Without the project, invasive plants such as *Arundo* and Himalayan blackberry (*Rubus discolor*) would continue to spread across the landscape, further decreasing the quality of riparian and aquatic habitat in the area. With the project, 4 acres of riparian habitat would be restored by removing invasive plants from 0.4 acres and planting native vegetation including trees, shrubs, and grasses that would enhance instream flows and riparian function throughout the four-acre area and improve aquatic habitat in Ackerman Creek. This riparian restoration would also improve aquatic habitat in Ackerman Creek, increase carbon sequestration in the restored riparian areas, and decrease future costs associated with sediment removal.

2. Water-Quality Benefits

This project would create water-quality benefits described below. Table 16-402 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Avoided Cost of Sediment Deposition (Quantifiable). The project would reduce costs associated with sediment removal that are currently incurred by the Pinoleville Pomo Nation. Project sponsors estimate that the project would reduce these costs by $2,500 every other year, beginning in 2012.

Beneficiaries of this benefit include all members of the tribe insofar as the tribe would have more resources to fund other projects and initiatives.

Passive-Use Value Associated with Increases in Salmonid Populations (Unquantifiable). By improving riparian function, the project likely would increase water quality and enhance aquatic

habitat used by salmon in Ackerman Creek. Project sponsors have estimated that the project would increase the number of days in which water flows through Ackerman Creek by 60 days. This increase would extend the period of time in which the creek provides aquatic habitat suitable for sustaining salmon populations. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available information. Research suggests, however, that reducing sediment loading in salmon-bearing streams would improve the function of spawning and rearing habitat, potentially leading to increases in juvenile salmonid survival and increased salmonid populations (NMFS 2010, CDFGH 2004).

This benefit captures the passive-use value many Californians place on the continued existence of thriving salmon populations within the state. If data were available to quantify this, we would employ a value of $2,000 per additional fish per year as a rough estimate of the passive-use benefit of increased salmon populations.[14]

The beneficiaries of this benefit would be Californians who value the survival of healthy salmon populations in California, but may never fish or directly interact with salmon.

Cultural Value Associated with Increases in Salmon Populations (Unquantifiable). By improving riparian function, the project likely would increase water quality and enhance aquatic habitat used by salmon in Ackerman Creek. Project sponsors have estimated that the project would increase the number of days in which water flows through Ackerman Creek by 60 days. This increase would extend the period of time in which the creek provides aquatic habitat suitable for sustaining salmon populations. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available information. Research suggests, however, that reducing sediment loading in salmon-bearing streams would improve the function of spawning and rearing habitat, potentially leading to increases in juvenile salmonid survival and increased salmonid populations (NMFS 2010, CDFGH 2004).

This benefit captures the cultural value many Native American people place on the continued existence of thriving salmon populations within the state. Unlike many Californians who ascribe a monetary willingness to pay to protect salmon, even if they never intend to directly fish or watch them, many Native Americans recognize the importance of salmon outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we recognize the cultural significance that arises from the projects' improvements to salmonid populations and their habitat apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include Native American tribal members in the region and other Californians who believe the continued existence of salmonid populations and their habitat is essential to cultural and spiritual well-being.

[14] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

3. Other Benefits

This project would create water-quality benefits described below. Table 16-402 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Passive-Use Value Associated with Increases in Forest Biodiversity (Quantifiable). The project would remove invasive vegetation from 0.4 acres of riparian habitat and would restore a total of 4 acres of riparian habitat by planting native vegetation such as trees, shrubs, and grasses, promoting species diversity and riparian function. This restoration would be beneficial to terrestrial and avian wildlife by improving habitat conditions in the area. It would also improve several water quality and water quantity characteristics in the adjacent Ackerman Creek. These water-based improvements enhance the quality of aquatic habitat in Ackerman Creek.

Data are insufficient to delineate specific impacts of the project's restoration efforts on the ecosystem services provided by this area of riparian habitat. For our analysis, we use a passive use value of $120 per acre of riparian habitat per year to estimate the value of the benefits attributable to riparian restoration.[15] This passive use value estimates how much society would be willing to pay for riparian habitat solely for its existence, aside from any benefits received directly or indirectly from the habitat's function. By only considering passive use, we likely underestimate the total value of the benefits derived from riparian restoration. This value also may underestimate the total value, to the extent that it does not account for potential increases in the biodiversity of habitat adjacent to the restored area.

The beneficiaries of this benefit would include Californians who value the existence of forest biodiversity in northern California.

Cultural Value Associated with Increases in Forest Biodiversity (Unquantifiable). The project would remove invasive vegetation from 0.4 acres of riparian habitat and would restore a total of 4 acres of riparian habitat by planting native vegetation such as trees, shrubs, and grasses, promoting species diversity and riparian function. This restoration would be beneficial to terrestrial and avian wildlife by improving habitat conditions in the area. It would also improve several water quality and water quantity characteristics in the adjacent Ackerman Creek. These water-based improvements enhance the quality of aquatic habitat in Ackerman Creek.

These native plants, and the native wildlife populations they support, would have higher value for Native American tribes than the existing ecological resources, because the native species have cultural significance to Native Americans, who use them for their edible, medicinal, and spiritual properties. Unlike many Californians who ascribe a monetary willingness to pay to restore native forests and increase ecological biodiversity, many Native Americans recognize the importance of restoring this native biodiversity outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we identify the cultural significance that arises

[15] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

from the projects' restoration of forest ecosystems apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include Native American tribal members in the region and other Californians who believe the continued existence of native, culturally-important plant and animal species is essential to cultural and spiritual well-being.

Avoided Cost of Carbon Dioxide Emissions (Quantifiable). The project would remove invasive plant species from 0.4 acres of riparian habitat and would plant native vegetation across 4 acres of riparian habitat including trees, shrubs, and grasses geared toward improving riparian function. This change in vegetation likely would increase the amount of carbon sequestered in the area. For our analysis, we assume the project would sequester 5.6 to 8.4 tons of carbon dioxide per year, depending on the year and the age of the stand.[16] The actual amount of sequestered carbon dioxide is dependent on many variables including but not limited to the precise mix of species planted, the density of the saplings, the age of the saplings, climate patterns, and the surrounding vegetation and land uses.

By sequestering carbon dioxide that would otherwise be released into the atmosphere, the project would, in a small way, reduce or delay potentially harmful costs associated with climate change. We use a middle value from the literature to estimate the social cost of carbon dioxide at $32.49/ton of carbon dioxide in 2009. We assume this value increases, in real terms, by 2.5 percent per year.[17]

Insofar as the carbon sequestration accomplished by this project reduces the potential negative impacts of climate change, beneficiaries of this benefit would include all residents in California, indeed the entire global population.

Value Associated with Increase in Number of Recreation Days (Unquantifiable). By restoring riparian function, project sponsors suggest the project would increase the number of days in which individuals can participate in water-based recreation along Ackerman Creek. Project sponsors estimate the project would increase the water-based recreation season by 60 days each year. Research suggests that the consumer surplus associated with various water-based recreation activities in the Pacific Coast region ranges from $30.50 for swimming to $50.00 for fishing, per person per day (Loomis 2005).[18] Data are insufficient to estimate the increase in recreation days experienced due to the project, but it is reasonable to assume that, if the area is currently used for recreation, it would be used more if water was available throughout the summer.

The beneficiaries of this benefit would include rafters, swimmers, anglers, and hikers who recreate along Ackerman Creek.

[16] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

[17] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

[18] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

Enhanced Human and Social Capital (Unquantifiable). Part of the project would involve long-term maintenance of the riparian area completed by tribal youth as part of a wilderness management program. While maintaining the habitat, the students would learn how to identify invasive species in the area and would learn about the negative impacts of these plants on the local ecosystem. The students would also learn how to plant and care for native vegetation and expand their knowledge of cultural and traditional practices. It is impossible to quantify the precise value of this educational component of the project with the information currently available. This component of the project would have a positive benefit insofar as it increases the human and social capital among the area's youth. Participating students would learn about their ecosystem and heritage and likely would develop bonds promoting habitat management in the future.

Beneficiaries of this benefit include the youths participating, the larger community, and any communities to which the youths bring and implement the knowledge gained through participation.

345–Bodega Bay Water Resources Management Project, Gold Ridge Resource Conservation District

1. Project Description and Background

The Bodega Bay Water Resources Management Project would restore instream and riparian habitat, provide water-collection tanks for landowners who agree to reduce water withdrawals from streams, initiate leak detection and repair activities in the communities of Valley Ford and Bodega, initiate public education efforts, and increase monitoring activities in the region's watersheds. Without the project, sediment would deposit into salmon-bearing streams, stream reaches within the Estero Americano and Salmon Creek watersheds would provide lower-quality salmonid habitat, property owners would divert water from streams for agricultural and municipal uses, and water systems would continue to operate with leaking infrastructure. With the project, sediment would be removed or stabilized and restoration activities in riparian areas would provide improvements for salmonid habitat and salmonid populations. Instream flows would increase as landowners rely on other sources of water for agricultural and municipal uses, and leaks are repaired. Water systems within the communities of Valley Ford and Bodega would experience lower operations costs, because they would not treat water lost to leakage.

2. Water-Quality Benefits

This project would create water-quality benefits described below. Table 16-345 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Avoided Costs of Sediment Deposition (Quantifiable). The project would directly remove or stabilize 6,200 cubic yards, or 5,859 tons, of sediment by restoring and reforesting eroding gullies.[19] The restoration projects would be complete after the 2013 field season, and we assume the full

[19] Conversion from cubic yards to sediment assumes 1 cubic yard of sediment equals 0.945 tons (Rice and Sherbin 1977). The U.S. Forest Service has applied this conversion to estimate sediment erosion in watersheds in Northern California.

level of annual benefits would begin accruing in 2014. Annual data on the baseline levels (without the project) of sediment deposition from the areas the project would affect into the Estero Americano watershed are unavailable. Because data aren't available to identify what the actual annual rate of deposition would be without the project, we use a conservative estimate. Knowing that unmaintained roads are considered "chronic sediment sources" that "bleed" sediment into a watercourse over time, we assume an equal amount of sediment would deposit into the stream each year, for a period of 10 years, about 586 tons per year.

By addressing sediment, the project would reduce the potential load of sediment available to deposit into the water bodies within the Estero Americano watershed, and avoid the costs that occur when that sediment deposits into water bodies. We calculate the value of the avoided costs of sediment deposition by multiplying $11.28 per ton, which represents the costs associated with sediment deposition within the North Coast region,[20] by the total tons of sediment removed each year, distributed equally over a 10-year period. This method may underestimate the value of the benefit if, without the project, the total amount of sediment the project would remove would have eroded at a faster rate (more than 586 tons per year). It may overestimate the value if, without the project, the sediment would have eroded at a slower annual rate (less than 586 tons per year).

The beneficiaries of this benefit would include a broad cross-section of Californians, including downstream domestic, municipal, and agricultural water users who withdraw water from affected water bodies; freshwater and marine recreational and commercial fishermen; people who recreate in and nearby downstream water bodies; and farmers, municipal officials, and other property owners who maintain infrastructure downstream of the project area.

Passive-Use Value Associated with Increases in Salmonid Populations (Unquantifiable). By reducing the amount of sediment deposited in salmon-bearing streams and restoring instream and riparian habitat, the project would enhance salmonid habitat in Salmon Creek and Estero Americano. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available data. Research suggests, however, that reducing sediment loading in salmon-bearing streams and increased complexity of habitat from added woody debris would improve the function of spawning and rearing habitat and lead to increases in juvenile salmon survival and increased salmon populations (NMFS 2010, CDFGH 2004).

This benefit captures the passive-use value many Californians place on the continued existence of thriving salmon populations within the state. If data were available to quantify this, we would

[20] The total costs include costs associated with maintaining irrigation ditches and canals, marine recreational and commercial fishing, freshwater fisheries, flood damage, road drainage ditches, municipal and industrial water use, municipal water treatment, power production, soil productivity, water-based recreation, and navigation. See regional-level benefits section for a description of the methodology and source used to derive this estimate.

employ a value of $2,000 per additional fish per year as a rough estimate of the passive-use benefit of increased salmon populations.[21]

The beneficiaries of this benefit would be Californians who value the survival of healthy salmon populations in California, but may never fish or directly interact with salmon.

Cultural Value Associated with Increases in Salmon Populations (Unquantifiable). By reducing the amount of sediment deposited in salmon-bearing streams and restoring instream and riparian habitat, the project would enhance salmonid habitat in Salmon Creek and Estero Americano. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available data. Research suggests, however, that reducing sediment loading in salmon-bearing streams and increased complexity of habitat from added woody debris would improve the function of spawning and rearing habitat and lead to increases in juvenile salmon survival and increased salmon populations (NMFS 2010, CDFGH 2004).

This benefit captures the cultural value many Native American people place on the continued existence of thriving salmon populations within the state. Unlike many Californians who ascribe a monetary willingness to pay to protect salmon, even if they never intend to directly fish or watch them, many Native Americans recognize the importance of salmon outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we recognize the cultural significance that arises from the projects' improvements to salmonid populations and their habitat apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include Native American tribal members in the region and other Californians who believe the continued existence of salmonid populations and their habitat is essential to cultural and spiritual well-being.

3. Other Benefits

This project would create water-quality benefits described below. Table 16-345 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Passive-Use Value Associated with Increases in Forest Biodiversity (Quantifiable). The project would restore 19.2 acres of riparian forest habitat by planting 3,000 to 4,000 trees and plants, primarily dogwood (*Cornus* sp.), Oregon ash (*Fraxinus latifolia*), coast redwood (*Sequoia sempervirens*), native blackberry (*Rubus ursinus*), snowberry (*Symphoricarpos albus*), sedges and rushes, box elder (*Acer negundo*), red alder (*Alnus rubra*) and red willow (*Salix laevigata*). The increased diversity of plants likely would increase the amount of habitat for other native wildlife. Overall, the project likely would directly increase the biodiversity of the restored acres, and potentially also indirectly increase the biodiversity of the adjacent habitat.

[21] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

For our analysis, we use a passive use value of $120 per acre of riparian habitat per year to estimate the value of the benefits attributable to riparian restoration.[22] This passive use value estimates how much society would be willing to pay for riparian habitat solely for its existence, aside from any benefits received directly or indirectly from the habitat's function. By only considering passive use, we likely underestimate the total value of the benefits derived from riparian restoration. This value also may underestimate the total value to the extent that it does not account for potential increases in the biodiversity of habitat adjacent to the restored area. We multiply this by 19.2, the number of acres the project would restore.

The beneficiaries of this benefit would include Californians who value the existence of forest biodiversity in northern California.

Cultural Value Associated with Increases in Forest Biodiversity (Unquantifiable). The project would restore 19.2 acres of riparian forest habitat by planting 3,000 to 4,000 trees and plants, primarily dogwood, Oregon ash, coast redwood, native blackberry, snowberry, sedges and rushes, box elder, red alder and red willow. The increased diversity of plants likely would increase the amount of habitat for other native wildlife. Overall, the project likely would directly increase the biodiversity of the restored acres, and potentially also indirectly increase the biodiversity of the adjacent habitat.

These native plants, and the native wildlife populations they support, would have higher value for Native American tribes than the existing ecological resources, because the native species have cultural significance to the region's Native American people, who use them for their edible, medicinal, and spiritual properties. Unlike many Californians who ascribe a monetary willingness to pay to restore native forests and increase ecological biodiversity, many Native Americans recognize the importance of restoring this native biodiversity outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we identify the cultural significance that arises from the projects' restoration of forest ecosystems apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include Native Americans in the region who believe the existence of native, culturally-important plant and animal species is essential to cultural and spiritual well-being.

Avoided Cost of Carbon Dioxide Emissions (Quantifiable). The project would plant 19.2 acres of native trees, shrubs, and grasses. This change in vegetation likely would increase the amount of carbon sequestered in the area. For our analysis, we assume the project would sequester 27.19 to 43.37 tons of carbon dioxide per year, depending on the year and the age of the stand.[23] Over a period of 50 years, it would sequester a total of 1,453 tons of carbon dioxide. The actual amount of sequestered carbon dioxide is dependent on many variables, including, but not limited to, the

[22] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

[23] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

precise mix of species planted, the density of the saplings, the age of the saplings, climate patterns, and the surrounding vegetation and land uses.

By sequestering carbon dioxide that would otherwise be released into the atmosphere, the project would reduce or delay potentially harmful costs associated with climate change. We use a middle value from the literature to estimate the social cost of carbon dioxide at $32.49/ton of carbon dioxide in 2009. We assume this value increases, in real terms, by 2.5 percent per year.[24]

The beneficiaries of this benefit would include all residents of California (indeed the entire global population).

Enhanced Human and Social Capital (Unquantifiable). The project's education activities, including educational workshops reaching approximately 150 people (6 workshops with 25 attending each), would increase the human capital in the region by increasing the level of technical knowledge land owners and land managers have to apply to solving water quality problems in the Salmon River and Estero Americano watersheds. Data are unavailable to quantify the economic benefits arising from these effects, but they could lead to lower costs of management for land managers and land owners, or the production of additional water quality and salmon-related benefits, similar to those discussed above.

The beneficiaries of this benefit would include land owners and land managers within the Salmon Creek and Estero Americano watersheds, and the communities in which they reside. Additionally Native Americans and all Californians would benefit from any additional water quality and salmon-related benefits due to the enhanced human and social capital wrought through project implementation.

292–Lower Russian River Water Quality Improvement Project, Sotoyome Resource Conservation District

1. Project Description and Background

The Lower Russian River Water Quality Improvement Project would upgrade and/or decommission 11.7 miles of road and stream crossings in the Austin Creek watershed to accommodate 100-year storm flows, educate property owners on best practices for rural road improvement, provide subsidies for septic system evaluations, and educate property owners about preventing pathogenic pollution from septic systems. Without the project, sediment would deposit into salmon-bearing streams in the Austin Creek watershed and pathogenic pollution from private septic systems would cause ongoing water quality problems in the Lower Russian River watershed. Limited information would be available about the quantity, timing, and source of the pollution, because water quality monitoring activities would not be well-supported. With the project, sediment would be removed or stabilized, reducing the overall amount entering the watershed's water bodies. Habitat for

[24] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

endangered coho salmon and steelhead trout will be improved through sediment reduction in high priority streams in Austin Creek. Septic systems would be improved, reducing the amount of pathogenic pollution adversely affecting the water bodies. Property owners and land managers would be empowered with local water quality information to more effectively design and adapt programs that target water quality issues.

2. Water-Quality Benefits

This project would create water-quality benefits described below. Table 16-292 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Avoided Costs of Sediment Deposition (Quantifiable). The project would directly remove or stabilize 13,150 cubic yards, or 12,427 tons, of sediment by decommissioning 11.7 miles of roads in the Austin Creek watershed.[25] The sediment removal would be complete after the 2012 field season, and we assume the full level of annual benefits would begin accruing in 2013. Annual data on the baseline levels (without the project) of sediment deposition from the areas the project would affect into the Austin Creek watershed are unavailable. Because data aren't available to identify what the actual annual rate of deposition would be without the project, we use a conservative estimate. Knowing that unmaintained roads are considered "chronic sediment sources" that "bleed" sediment into a watercourse over time, we assume an equal amount of sediment would deposit into the stream each year, for a period of 10 years, about 1,243 tons per year. Additional sediment loading into the watershed could be reduced if landowners undertake work to improve other roads, which the project could catalyze through the planned education and outreach efforts.

By removing sediment, the project would reduce the potential load of sediment available to deposit into the water bodies within the Austin Creek watershed, and downstream in the Lower Russian River watershed, and avoid the costs that occur when that sediment deposits into water bodies. We calculate the value of the avoided costs of sediment deposition by multiplying $11.28 per ton, which represents the costs associated with sediment deposition within the North Coast region,[26] by the total tons of sediment removed each year, distributed equally over a 10-year period. This method may underestimate the value of the benefit if, without the project, the total amount of sediment the project would remove would have eroded at a faster rate (more than 1,243 tons per year). It may overestimate the value if, without the project, the sediment would have eroded at a slower annual rate (less than 1,243 tons per year). We have not attempted to quantify the value of the additional sediment reduction activities the project could catalyze, but to the extent that additional tons of

[25] Conversion from cubic yards to sediment assumes 1 cubic yard of sediment equals 0.945 tons (Rice and Sherbin 1977). The U.S. Forest Service has applied this conversion to estimate sediment erosion in watersheds in Northern California.

[26] The total costs include costs associated with maintaining irrigation ditches and canals, marine recreational and commercial fishing, freshwater fisheries, flood damage, road drainage ditches, municipal and industrial water use, municipal water treatment, power production, soil productivity, water-based recreation, and navigation. See regional-level benefits section for a description of the methodology and source used to derive this estimate.

sediment are avoided, the economic benefits would have a per-unit value similar to that described here.

The beneficiaries of this benefit would include a broad cross-section of Californians, including downstream domestic, municipal, and agricultural water users who withdraw water from affected water bodies; freshwater and marine recreational and commercial fishermen; people who recreate in and nearby downstream water bodies; and farmers, municipal officials, and other property owners who maintain infrastructure downstream of the project area.

Passive-Use Value Associated with Increases in Salmonid Populations (Unquantifiable). By reducing the amount of sediment deposited from existing roads and stream crossings and reducing nutrient loading from septic systems in salmon-bearing streams, the project would enhance salmonid habitat in the Austin Creek watershed and downstream in the Lower Russian River watershed. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available data. Research suggests, however, that reducing sediment loading in salmon-bearing streams and reducing nitrogen and phosphorous levels—thereby increasing dissolved oxygen levels—would improve the function of spawning and rearing habitat and lead to increases in juvenile salmonid survival and increased salmonid populations (NMFS 2010, CDFGH 2004).

This benefit captures the passive-use value many Californians place on the continued existence of thriving salmon populations within the state. If data were available to quantify this, we would employ a value of $2,000 per additional fish per year as a rough estimate of the passive-use benefit of increased salmon populations.[27]

The beneficiaries of this benefit would be Californians who value the survival of healthy salmon populations in California, but may never fish or directly interact with salmon.

Cultural Value Associated with Increases in Salmon Populations (Unquantifiable). As we describe above, the project would enhance salmonid habitat in the Austin Creek Watershed. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available data. Research suggests, however, that reducing sediment loading in salmon-bearing streams and reducing nitrogen and phosphorous levels—thereby increasing dissolved oxygen levels—would improve the function of spawning and rearing habitat and lead to increases in juvenile salmon survival and increased salmon populations (NMFS 2010, CDFGH 2004).

This benefit captures the cultural value many Native Americans place on the continued existence of thriving salmon populations within the state. Unlike many Californians who ascribe a monetary willingness to pay to protect salmon, even if they never intend to directly fish or watch them, many

[27] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

Native Americans recognize the importance of salmon outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we recognize the cultural significance that arises from the projects' improvements to salmonid populations and their habitat apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include Native American tribal members in the region and other Californians who believe the continued existence of salmonid populations and their habitat is essential to cultural and spiritual well-being.

Potential Increased Quality of Recreation Opportunities from Reduced Pathogenic Loading (Unquantifiable). Pathogenic pollution in the Lower Russian River watershed contaminants beaches along the river that are used for recreation.[28] Several reaches of the Lower Russian River, which are used for water-contact recreation, such as swimming and boating, are currently listed as impaired for pathogens under Section III03(d) of the Clean Water Act. Septic systems are one source of this pathogenic pollution, although data are currently unavailable to estimate the share of pollution they would contribute without the project, relative to other sources. Data are also unavailable to estimate how much pathogenic pollution the project's septic system evaluation program, demonstration project, and community outreach components would reduce in the targeted water bodies. The project's water quality monitoring component would provide data to verify the contribution of septic systems to pathogenic pollution, and the effect of the project on pathogen loads in the affected water bodies.

If the project successfully lowers pathogens in the Russian River, it could produce economic benefits by reducing the risk of infection caused by contact with water while swimming or boating. A study of the public-health costs of bacterial contamination of public beaches in Southern California suggests that swimmers are willing to pay between $42 and $350 to avoid getting sick from swimming in contaminated water (Given, Pendleton and Boehm 2006). The higher end of this range represents both market and non-market costs associated with gastro-intestinal (GI) illness, including loss of time at work, medical expenses, and the psychological impacts of getting sick, while the lower estimate only includes market costs associated with water-borne GI infections. The Russian River Recreation and Park District Master Plan estimates that on average, 610 people use Steelhead Beach each day, and 226 people swim at Steelhead Beach each day (Russian River Parks and Recreation District No Date). If the project reduced the number of times the water at Steelhead Beach exceeds water quality standards for bacteria by just one occurrence each year, it could produce an economic benefit of about $9,500 per year. It could produce greater levels of economic benefits each year to the extent that it reduces the number of days Steelhead Beach exceeds state water quality standards by more than one, and to the extent that it reduces the risk of illness for swimmers and boaters at other locations throughout the watershed.

[28] Steelhead Beach on the Lower Russian River has exceeded state standards for bacterial infectious agents three times in 2010. Steelhead Beach, Monte Rio Beach, and the Forestville Access Beach each exceeded state standards in 2009. (County of Sonoma, Environmental Health Division 2010)

Because data are insufficient at this time to support an estimate of the project's likely effect on pathogen levels in the Lower Russian River watershed, however, we leave this benefit unquantified.

Potential beneficiaries of this benefit would include people who use the Lower Russian River beaches for swimming and water-contact recreation. Many of these people likely come from the local area, but also come from elsewhere in California, or outside of California.

Increased Quality of Drinking Water (Unquantifiable). Pathogenic pollution in the Lower Russian River has the potential to contaminate drinking-water sources. Septic systems are one source of this pathogenic pollution, although data are currently unavailable to estimate the share of pollution they would contribute without the project, relative to other sources. Data are also unavailable to estimate how much pathogenic pollution the project's septic system evaluation program, demonstration project, and community outreach components would reduce in the targeted water bodies. The project's water quality monitoring component would provide data to verify the contribution of septic systems to pathogenic pollution, and the effect of the project on pathogen loads in the affected water bodies. Although drinking water is withdrawn from the Lower Russian River, the number of people that depend on these sources is currently unknown. The project would support monitoring and information-collection efforts to better-understand the extent of this use, and the potential impact pathogenic pollution could have on these people.

Potential beneficiaries of this benefit would include people who obtain their drinking water from the Lower Russian River.

3. Other Benefits

This project would create water-quality benefits described below. Table 16-292 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Improved Reliability of Road Access (Unquantifiable). The project would improve the design of existing stream crossings and increase the stability of existing roads in the Austin Creek watershed, to the point where they should withstand up to 100-year flooding conditions. This would reduce the probability of a road failure during most storm events and increase the reliability of the region's transportation network. Project sponsors estimate that 30 people travel the roads the project would address each day, several times per day, resulting in at least 60 trips per day. In addition, Redwoods State Park rangers would use the roads for patrol activities if they were more reliable. Currently, they patrol the outer reaches of the park by foot, if at all. Available data are insufficient to quantify this benefit in economic terms, although it could lead to reduced travel time for people who use the affected roads and reduced time spent on patrols for park rangers.

The beneficiaries of this benefit would include the people who use the affected roads each day and Redwoods State Park rangers and managers.

Improved Access for Emergency Response Vehicles (Unquantifiable). Improving the condition of roads in the Austin Creek watershed would allow emergency response vehicles access to certain

areas that are largely inaccessible. One of the roads the project would target is a fire access road that connects remote portions of the watershed to one another. Improving this road would potentially improve response to forest fires as well as structural fires. Other road improvements would allow Redwood State Park rangers to use motorized vehicles to aid lost or injured hikers and enforce park rules and regulations. The available data are insufficient to quantify this benefit in economic terms, although it could lead to reduced property-insurance rates for properties that gain more reliable access by emergency-response vehicles, and reduced costs associated with responding to emergencies.

The beneficiaries of this benefit would include properties accessible by roads targeted for improvement and Redwoods State Park rangers and managers.

364–Mendocino Jumpstart Integrated Water Plan, Mendocino County Water Agency/ Planning Department

1. Project Description and Background

The Mendocino Jumpstart Integrated Water Plan would implement seven Low-Impact Development (LID) and sustainable practice projects and would provide additional educational opportunities via college courses and county workshops to the community. Without the project, the County's current irrigation and stormwater management practices would continue in a business-as-usual way. With the project, stormwater runoff from the County campus parking lot would be treated with LID techniques before entering Orrs Creek, the College's sports field would use recycled irrigation water, two rainwater catchment tanks would save additional water, and the County would convert from grass to xeric landscape. The project also would build a bioswale/wetland and vernal pool to create new habitat while treating stormwater before entering Hensley Creek and would provide educational opportunities at Mendocino College to promote learning and skill development with these and other sustainable techniques.

2. Water-Quality Benefits

This project would create water-quality benefits described below. Table 16-364 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Avoided Costs of Sediment Deposition (Unquantifiable). The proposed project would remove silt and sediment from stormwater by filtering it through bioswales before it reaches Orrs Creek. Data are currently unavailable to estimate the amount of sediment that the project would remove. If these data were available, we would calculate the value of the avoided costs of sediment deposition by multiplying $11.28 per ton, which represents the costs associated with sediment deposition within the North Coast region.[29]

[29] The total costs include costs associated with maintaining irrigation ditches and canals, marine recreational and commercial fishing, freshwater fisheries, flood damage, road drainage ditches, municipal and industrial water use, municipal water

The beneficiaries of this benefit would include a broad cross-section of Californians, including downstream domestic, municipal, and agricultural water users who withdraw water from affected water bodies; freshwater and marine recreational and commercial fishermen; people who recreate in and nearby downstream water bodies; and farmers, municipal officials, and other property owners who maintain infrastructure downstream of the project area.

Passive-Use Value Associated with Increases in Salmonid Populations (Unquantifiable). By reducing the amount of sediment and contaminants deposited from parking lots, the project would enhance salmonid habitat in the Orrs Creek watershed. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available information. Research suggests, however, that reducing sediment loading in salmon-bearing streams would improve the function of spawning and rearing habitat, potentially leading to increases in juvenile salmonid survival and increased salmonid populations (NMFS 2010, CDFGH 2004).

This benefit captures the passive-use value many Californians place on the continued existence of thriving salmon populations within the state. If data were available to quantify this, we would employ a value of $2,000 per additional fish per year as a rough estimate of the passive-use benefit of increased salmon populations.[30]

The beneficiaries of this benefit would be Californians who value the survival of healthy salmon populations in California, but may never fish or directly interact with salmon.

Cultural Value Associated with Increases in Salmon Populations (Unquantifiable). By reducing the amount of sediment and contaminants deposited from parking lots, the project would enhance salmonid habitat in the Orrs Creek watershed. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available information. Research suggests, however, that reducing sediment loading in salmon-bearing streams would improve the function of spawning and rearing habitat, potentially leading to increases in juvenile salmonid survival and increased salmonid populations (NMFS 2010, CDFGH 2004).

This benefit captures the cultural value many Native Americans place on the continued existence of thriving salmon populations within the state. Unlike many Californians who ascribe a monetary willingness to pay to protect salmon, even if they never intend to directly fish or watch them, many Native Americans recognize the importance of salmon outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we recognize the cultural

treatment, power production, soil productivity, water-based recreation, and navigation. See regional-level benefits section for a description of the methodology and source used to derive this estimate.

[30] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

significance that arises from the projects' improvements to salmonid populations and their habitat apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include Native American tribal members in the region and other Californians who believe the continued existence of salmonid populations and their habitat is essential to cultural and spiritual well-being.

Avoided Water Treatment and Compliance Costs (Unquantifiable). The proposed project would treat 8,563,294 gallons of contaminated water through the county parking lot retrofit, the College Bioswale, and the College's Sports Fields. The parking lots receive high concentrations of polycyclic aromatic hydrocarbons (PAHs) as well as particulates, and heavy metals from vehicles. The accumulated contaminants mobilize during rainfall events, transport to storm drains, and eventually enter nearby water bodies. Biofiltration techniques, such as with bioswales are effective at breaking down hydrocarbons and capturing heavy metals and other particulates. The project would result in decreased turbidity, hydrocarbons, and metals in Orrs Creek and reduce fertilizer discharged to Hensley Creek. The project may also reduce water temperature, because water that infiltrates may be released more slowly during the summer rather than flowing off the surface and into the Creek directly during winter storm events.

The value associated with this benefit would include avoided costs associated with treating contaminants in water prior to consumption, or avoided costs associated with compliance with water quality standards. Data are insufficient to quantify the value of these benefits.

The beneficiaries of this benefit would include a broad cross-section of Californians, including downstream domestic, municipal, and agricultural water users who withdraw water from affected water bodies; freshwater and marine recreational and commercial fishermen; people who recreate in and nearby downstream water bodies; and farmers, municipal officials, and other property owners who maintain infrastructure downstream of the project area.

3. Other Benefits

This project would create other-quality benefits described below. Table 16-364 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Passive Use Value Associated with Increases in Biodiversity (Quantifiable). The project would create a 0.5 acre vernal pool, which would be beneficial to terrestrial and acquatic wildlife, by improving habitat conditions in the area. Data are insufficient to delineate specific impacts of the project's restoration efforts on the ecosystem services provided by this area of riparian habitat. For our analysis, we use a passive use value of $120 per acre of vernal pool habitat per year to estimate the value of the benefits attributable to this new habitat.[31] This passive use value estimates how much society would be willing to pay for vernal pool habitat solely for its existence, aside from any

[31] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

benefits received directly or indirectly from the habitat's function. By only considering passive use, we likely underestimate the total value of the benefits derived from restoration.

The beneficiaries of this benefit would include Californians who value the existence of increased biodiversity and natural habitat in northern California.

Cultural Value Associated with Increases in Forest Biodiversity (Unquantifiable). The project would create a 0.5 acre vernal pool, which would be beneficial to terrestrial and acquatic wildlife, by improving habitat conditions in the area. Data are insufficient to delineate specific impacts of the project's restoration efforts on the ecosystem services provided by this area of riparian habitat.

Unlike many Californians who ascribe a monetary willingness to pay to restore native forests and increase ecological biodiversity, many Native Americans recognize the importance of restoring this native biodiversity outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we identify the cultural significance that arises from the projects' restoration of forest ecosystems apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include Native American tribal members in the region and other Californians who believe the continued existence of native, culturally-important plant and animal species is essential to their cultural and spiritual well-being.

Increased Quantity of Recreation (Quantifiable and Unquantifiable). The project would create a half-acre vernal pool, which would provide opportunities for people to walk, watch wildlife, and seek solitude. While data are not available to estimate the types of users who would recreate on the vernal pool, the Mendocino County Water Agency estimates the pool would draw 50 new recreational visitors per year.

As no data are available to estimate the type of users that would recreate at the vernal pool, we estimate the potential increase in economic value associated with this recreation experience by applying a general recreation value of about $28 per user, per day to the estimated visitation data described above.[32]

The beneficiaries would include people who enjoy hiking, wildlife watching, and other types of nature-based recreation.

Enhanced Human and Social Capital (Unquantifiable). Part of the project would fund eight classes covering topics associated with LID and sustainable projects implemented on Mendocino College and County campuses to include approximately 160 students. This component of the project would have a positive benefit insofar as it increases the human and social capital among the area's youth and adults who participate in the classes. These educational opportunities at Mendocino College will

[32] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

promote learning and skill development with LID and other sustainable techniques, which the Agency hopes will have a long term influence on water conservation practices in the County. Data are unavailable to quantify the economic benefits arising from these effects, but they could lead to stormwater management for private and public entities or the production of additional water quality and water-efficiency benefits, similar to those discussed above.

The beneficiaries of this benefit would include the people who participate in the classes and the community at large. Additionally, if, as expected, the students utilize their education to produce similar projects with benefits such as those listed above, the beneficiaries would include community members wherever those students implement projects – locally, regionally, or throughout the state, nation, or world.

374-6–Nissah-Kah Creek Fish Passage, Hopland Band of Pomo Indians

1. Project Description and Background

The Nissah-Kah Creek Fish Passage project would improve fish passage for all age classes of steelhead and rainbow trout on two culverts of Nissah-Kah Creek. Without the project, steelhead and rainbow trout do not have access to the upper reaches of Nissah-Kah Creek. With the project, the culverts would accommodate both upstream and downstream passage for adult and juvenile steelhead trout and would provide a large improvement in the quantity and quality of habitat, potentially increasing the populations and survival potential for all life stages of steelhead and rainbow trout. This project will not only increase the viability of the remnant population of steelhead that spawn in Nissa-Kah Creek, but will also benefit salmonid restoration efforts in the Russian River HU and help to restore part of the cultural heritage of the Pomo Tribe.

2. Other Benefits

This project would create other benefits described below. Table 16-374-6 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Passive-Use Value Associated with Increases in Salmonid Populations (Unquantifiable). By reconstructing culverts, salmonid populations would have access to over 2 miles of additional spawning habitat in the Nissah-Kah Creek watershed. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available information. Increasing the amount of high-quality spawning habitat available to salmonids should increase their populations locally and downstream in freshwater and marine habitats.

This benefit captures the passive-use value many Californians place on the continued existence of thriving salmon populations within the state. If data were available to quantify this, we would

employ a value of $2,000 per additional fish per year as a rough estimate of the passive-use benefit of increased salmon populations.[33]

The beneficiaries of this benefit would be Californians who value the survival of healthy salmon populations in California, but may never fish or directly interact with salmon.

Cultural Value Associated with Increases in Salmon Populations (Unquantifiable). By reconstructing culverts, salmonid populations would have access to over 2 miles of additional spawning habitat in the Nissah-Kah Creek watershed. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available information. Increasing the amount of high-quality spawning habitat available to salmonids should increase their populations locally and downstream in freshwater and marine habitats.

This benefit captures the cultural value many Native Americans place on the continued existence of thriving salmon populations within the state. Unlike many Californians who ascribe a monetary willingness to pay to protect salmon, even if they never intend to directly fish or watch them, many Native Americans recognize the importance of salmon outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we recognize the cultural significance that arises from the projects' improvements to salmonid populations and their habitat apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include Native American tribal members in the region and other Californians who believe the continued existence of salmonid populations and their habitat is essential to cultural and spiritual well-being.

393–Russian River Arundo Removal and Riparian Enhancement, Sotoyome Resource Conservation District

1. Project Description and Background

The Russian River *Arundo* Removal and Riparian Enhancement Project would remove *Arundo*, an invasive plant species, from 150 acres of riparian habitat and would restore that area as well as an additional 50 acres with native vegetation, spanning a total of five linear miles along the Russian River. Without the project, the *Arundo* would remain intact, and would continue to spread across the landscape, further decreasing the quality of riparian and aquatic habitat in the area. With the project, 200 acres of riparian habitat would be restored to enhance riparian function, and *Arundo* would be removed from 150 acres, increasing instream flow and decreasing the likelihood of a catastrophic fire event.

[33] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

2. Water-Quality Benefits

This project would create water-quality benefits described below. Table 16-393 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Passive-Use Value Associated with Increases in Salmonid Populations (Unquantifiable). By removing *Arundo* and restoring riparian habitat adjacent to salmon-bearing streams, the project would enhance salmonid habitat in the Russian River watershed. The native vegetation the project would plant after removing *Arundo* would provide important shading benefits to the stream, reducing temperatures and improving levels of dissolved oxygen and other parameters important to salmonid survival. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available information. Research suggests, however, that restoring habitat adjacent to salmon-bearing streams would improve the function of spawning and rearing habitat, potentially leading to increases in juvenile salmonid survival and increased salmonid populations (NMFS 2010, CDFGH 2004).

This benefit captures the passive-use value many Californians place on the continued existence of thriving salmon populations within the state. If data were available to quantify this, we would employ a value of $2,000 per additional fish per year as a rough estimate of the passive-use benefit of increased salmon populations.[34]

The beneficiaries of this benefit would be Californians who value the survival of healthy salmon populations in California, but may never fish or directly interact with salmon.

Cultural Value Associated with Increases in Salmon Populations (Unquantifiable). By removing *Arundo* and restoring riparian habitat adjacent to salmon-bearing streams, the project would enhance salmonid habitat in the Russian River watershed. The native vegetation the project would plant after removing *Arundo* would provide important shading benefits to the stream, reducing temperatures and improving levels of dissolved oxygen and other parameters important to salmonid survival. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available information. Research suggests, however, that restoring habitat adjacent to salmon-bearing streams would improve the function of spawning and rearing habitat, potentially leading to increases in juvenile salmonid survival and increased salmonid populations (NMFS 2010, CDFGH 2004).

This benefit captures the cultural value many Native Americans place on the continued existence of thriving salmon populations within the state. Unlike many Californians who ascribe a monetary willingness to pay to protect salmon, even if they never intend to directly fish or watch them, many Native Americans recognize the importance of salmon outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we recognize the cultural

[34] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

significance that arises from the projects' improvements to salmonid populations and their habitat apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include Native American tribal members in the region and other Californians who believe the continued existence of salmonid populations and their habitat is essential to their cultural and spiritual well-being.

3. Other Benefits

This project would create other benefits described below. Table 16-393 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Passive-Use Value Associated with Increases in Forest Biodiversity (Quantifiable). The project would remove invasive vegetation from 150 acres of riparian habitat and replace it with native plant species, promoting species diversity and riparian function. Additional restoration efforts would take place on an adjacent 50-acre area. These restoration efforts would be beneficial to terrestrial and avian wildlife by improving habitat conditions in the watershed. They would also improve several water quality and water quantity characteristics in the adjacent Russian River. These water-based improvements enhance the quality of aquatic habitat in the Russian River. Improved aquatic habitat would increase fish populations and would improve the health of individual fish in the river.

Data are insufficient to delineate specific impacts of the project's restoration efforts on the ecosystem services provided by this area of riparian habitat. For our analysis, we use a passive use value of $120 per acre of riparian habitat per year to estimate the value of the benefits attributable to riparian restoration.[35] This passive use value estimates how much society would be willing to pay for riparian habitat solely for its existence, aside from any benefits received directly or indirectly from the habitat's function. By only considering passive use, we likely underestimate the total value of the benefits derived from riparian restoration. This value also may underestimate the total value, to the extent that it does not account for potential increases in the biodiversity of habitat adjacent to the restored area.

The beneficiaries of this benefit would include Californians who value the existence of forest biodiversity in northern California.

Cultural Value Associated with Increases in Forest Biodiversity (Unquantifiable). The project would remove invasive vegetation from 150 acres of riparian habitat and replace it with native plant species, promoting species diversity and riparian function. Additional restoration efforts would take place on an adjacent 50-acre area. These restoration efforts would be beneficial to terrestrial and avian wildlife by improving habitat conditions in the area. They would also improve several water quality and water quantity characteristics in the adjacent Russian River. These water-based

[35] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

improvements enhance the quality of aquatic habitat in the Russian River. Improved aquatic habitat would increase fish populations and would improve the health of individual fish in the river.

Unlike many Californians who ascribe a monetary willingness to pay to restore native forests and increase ecological biodiversity, many Native Americans recognize the importance of restoring this native biodiversity outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we identify the cultural significance that arises from the projects' restoration of forest ecosystems apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include Native American tribal members in the region and other Californians who believe the continued existence of native, culturally-important plant and animal species is essential to their cultural and spiritual well-being.

Avoided Cost of Carbon Dioxide Emissions (Quantifiable). The project would remove invasive plant species from 200 acres of riparian land and would replace them with native vegetation including trees, shrubs, and grasses geared toward improving riparian function. This change in vegetation likely would increase the amount of carbon sequestered in the area. For our analysis, we assume the project would sequester 283 to 452 tons of carbon dioxide per year, depending on the year and the age of the stand.[36] The actual amount of sequestered carbon dioxide is dependent on many variables including but not limited to the precise mix of species planted, the density of the saplings, the age of the saplings, climate patterns, and the surrounding vegetation and land uses.

By sequestering carbon dioxide that would otherwise be released into the atmosphere, the project would, in a small way, reduce or delay potentially harmful costs associated with climate change. We use a middle value from the literature to estimate the social cost of carbon dioxide at $32.49/ton of carbon dioxide in 2009. We assume this value increases, in real terms, by 2.5 percent per year.[37]

Insofar as the carbon sequestration accomplished by this project reduces the potential negative impacts of climate change, beneficiaries of this benefit would include all residents in California, indeed the entire global population.

Value of Decrease in Likelihood of Catastrophic Fire Event (Unquantifiable). Research suggests that *Arundo* increases the likelihood of a catastrophic fire event by 200-300 percent (Scott 1994). By removing *Arundo* and replacing it with native vegetation, the project would reduce the likelihood of a catastrophic fire event by at least half. Catastrophic fires are associated with several negative impacts on riparian and aquatic habitats and the wildlife therein. Chief among these negative effects is an increase in sedimentation. Furthermore, catastrophic fire decreases biological productivity accelerates insect and disease outbreaks, and changes historical migration routes for migratory

[36] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

[37] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

birds, terrestrial mammals, and aquatic wildlife (Bartuska and Eubanks 2004). Insofar as the project decreases the likelihood of catastrophic fires, it is likely to decrease firefighting costs, and reduce costs associated with fire-related emissions and risks to public health and safety.

Assuming the project decreases the likelihood of a catastrophic fire event in the area by half, it would also decrease the costs associated with catastrophic fire events by half. Data are insufficient to estimate the total value of these fire-related costs.

Beneficiaries of this benefit would include federal and state taxpayers, insofar as it decreases time and resources spent on fighting forest fires and on future projects aimed at restoring water quality in areas where forest fires increase sedimentation, and local residents insofar as it decreases the risk to biodiversity, aesthetic resources, and public health stemming from forest fires.

396–Copeland Creek Watershed Detention/Recharge, Habitat Restoration, and Steelhead Refugia Project, Sonoma County Water Agency

1. Project Description and Background

The Copeland Creek Watershed Detention/Recharge, Habitat Restoration, and Steelhead Refugia Project would remove invasive, non-native vegetation and restore 21 acres of riparian habitat, and strategically remove 10,395 tons of sediment from Copeland Creek. The project also would begin planning for off-stream stormwater detention basins to be constructed in the future, and would initiate a collaborative process among stakeholders in the region to efficiently coordinate restoration and environmental improvement projects. Without the project, invasive vegetation will remain intact, and would continue to spread across the landscape, further decreasing the quality of riparian and aquatic habitat in the area. Sediment deposition would continue to impose management costs on the Sonoma County Water Agency (SCWA) and other costs on downstream water users. A variety of environmental, landowner, and agency stakeholders would continue to initiate restoration activities in an ad-hoc, uncoordinated way. With the project, 21 acres of riparian habitat would be restored by removing invasive plants and planting native riparian vegetation including trees, shrubs, and grasses that would enhance riparian function. Sediment deposition would decrease, reducing the costs of future sediment-removal activities and reducing the water-quality-related costs incurred by downstream users. A program to educate and coordinate resources and information among stakeholders working in the Copeland Creek Watershed would enhance the human and social capital in the region, and facilitate more efficient planning and implementation of future restoration and water-quality-related projects.

2. Water-Quality Benefits

This project would create water-quality benefits described below. Table 16-396 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Avoided Cost of Sediment Deposition (Quantifiable). The project would reduce SCWA's costs associated with continuous instream sediment removal in Copeland Creek. Project sponsors

estimate that the project would reduce these costs by $20,000 per year for five years (from 2014 to 2018), until funding become available to construct detention basins.

Beneficiaries of this benefit would include managers and customers of SCWA.

Passive-Use Value Associated with Increases in Salmonid Populations (Unquantifiable). By restoring riparian habitat adjacent to salmon-bearing streams, the project would enhance salmonid habitat in the Copeland Creek watershed. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available information. Research suggests, however, that restoring habitat adjacent to salmon-bearing streams would improve the function of spawning and rearing habitat, potentially leading to increases in juvenile salmonid survival and increased salmonid populations (NMFS 2010, CDFGH 2004).

This benefit captures the passive-use value many Californians place on the continued existence of thriving salmon populations within the state. If data were available to quantify this, we would employ a value of $2,000 per additional fish per year as a rough estimate of the passive-use benefit of increased salmon populations.[38]

The beneficiaries of this benefit would be Californians who value the survival of healthy salmon populations in California, but may never fish or directly interact with salmon.

Cultural Value Associated with Increases in Salmon Populations (Unquantifiable). By restoring riparian habitat adjacent to salmon-bearing streams, the project would enhance salmonid habitat in the Copeland Creek watershed. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available information. Research suggests, however, that restoring habitat adjacent to salmon-bearing streams would improve the function of spawning and rearing habitat, potentially leading to increases in juvenile salmonid survival and increased salmonid populations (NMFS 2010, CDFGH 2004).

This benefit captures the cultural value many Native Americans place on the continued existence of thriving salmon populations within the state. Unlike many Californians who ascribe a monetary willingness to pay to protect salmon, even if they never intend to directly fish or watch them, many Native Americans recognize the importance of salmon outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we recognize the cultural significance that arises from the projects' improvements to salmonid populations and their habitat apart from the quantified passive-use value or other measures of economic benefits.

[38] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

The beneficiaries of this benefit would include Native American tribal members in the region and other Californians who believe the continued existence of salmonid populations and their habitat is essential to their cultural and spiritual well-being.

3. Other Benefits

This project would create other benefits described below. Table 16-396 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Passive-Use Value Associated with Increases in Forest Biodiversity (Quantifiable). The project would remove invasive vegetation, replant native species, and restore 21 acres of riparian habitat, promoting species diversity and riparian function. This restoration would benefit wildlife by improving habitat conditions in the area. It would also improve several water-quality and water-quantity characteristics in the adjacent Copeland Creek. These water-based improvements enhance the quality of aquatic habitat in Copeland Creek. Improved aquatic habitat could increase salmonid populations and would improve the health of salmonids and other fish in the creek.

Data are insufficient to delineate specific impacts of the project's restoration efforts on the ecosystem services provided by this area of riparian habitat. For our analysis, we use a passive use value of $120 per acre of riparian habitat per year to estimate the value of the benefits attributable to riparian restoration.[39] This passive use value estimates how much society would be willing to pay for riparian habitat solely for its existence, aside from any benefits received directly or indirectly from the habitat's function. By only considering passive use, we likely underestimate the total value of the benefits derived from riparian restoration. This value also may underestimate the total value, to the extent that it does not account for potential increases in the biodiversity of habitat adjacent to the restored area.

The beneficiaries of this benefit would include Californians who value the existence of forest biodiversity in northern California.

Cultural Value Associated with Increases in Forest Biodiversity (Unquantifiable). The project would remove invasive vegetation, replant native species, and restore 21 acres of riparian habitat, promoting species diversity and riparian function. This restoration would benefit wildlife by improving habitat conditions in the area. It would also improve several water-quality and water-quantity characteristics in the adjacent Copeland Creek. These water-based improvements enhance the quality of aquatic habitat in Copeland Creek. Improved aquatic habitat could increase salmonid populations and would improve the health of salmonids and other fish in the creek. These native plants, and the native wildlife and aquatic populations they support, would have higher value for Native American tribes than the existing ecological resources, because the native species have cultural significance for Native Americans, who use them for their edible, medicinal, and spiritual properties.

[39] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

Unlike many Californians who ascribe a monetary willingness to pay to restore native forests and increase ecological biodiversity, many Native Americans recognize the importance of restoring this native biodiversity outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we identify the cultural significance that arises from the projects' restoration of forest ecosystems apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include Native Americans in the region and beyond who use and value the existence of native, culturally-important plant and animal species.

Avoided Cost of Carbon Dioxide Emissions (Quantifiable). The project would remove invasive plant species from 21 acres of riparian land and would replace them with native vegetation including trees, shrubs, and grasses geared toward improving riparian function. This change in vegetation likely would increase the amount of carbon sequestered in the area starting in 2014. For our analysis, we assume the project would sequester 29.73 to 47.43 tons of carbon dioxide per year, depending on the year and the age of the stand.[40] The actual amount of sequestered carbon dioxide is dependent on many variables including but not limited to the precise mix of species planted, the density of the saplings, the age of the saplings, climate patterns, and the surrounding vegetation and land uses.

By sequestering carbon dioxide that would otherwise be released into the atmosphere, the project would, in a small way, reduce or delay potentially harmful costs associated with climate change. We use a middle value from the literature to estimate the social cost of carbon dioxide at $32.49/ton of carbon dioxide in 2009. We assume this value increases, in real terms, by 2.5 percent per year.[41]

Insofar as the carbon sequestration accomplished by this project reduces the potential negative impacts of climate change, beneficiaries of this benefit would include all residents in California, indeed the entire global population.

Enhanced Human and Social Capital (Unquantifiable). By initiating activities to coordinate resources and information among stakeholders working in the Copeland Creek Watershed and educate citizens, the project would enhance the human and social capital in the region. SCWA would work in partnership with the Sonoma County Agricultural Preservation and Open Space District, Sonoma County Regional Parks, the County of Sonoma, the City of Rohnert Park, Sonoma State University, the Conservation Corps North Bay and the University District, LLC to foster collaboration, share technical expertise, costs, and work products, and educate stakeholders. Through monthly conference calls, quarterly meetings, and soliciting review and comment on key documents, SCWA would provide opportunities for stakeholders to connect, build relationships and trust, and share information. Education activities, including educational forums and career-building opportunities,

[40] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

[41] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

would increase the human capital in the region, especially among individuals involved in Conservation Corps North Bay, Summer Youth Ecology Corps, Sonoma County Adult Youth Development, and the Center for Social and Environmental Stewardship. These efforts to build human and social capital could allow the community to more efficiently and effectively solve problems and make decisions that affect the environmental and social health within the watershed. Data are unavailable to quantify the economic benefits arising from these effects, but they are likely to lead to lower costs of management and the production of additional water quality and salmon-related benefits, similar to those discussed above.

The beneficiaries of this benefit would include land owners, managers, and other stakeholders within communities in the Copeland Creek Watershed.

Design and Planning for Future Stormwater Detention Basins (Unquantifiable). Some of the project's funding would be used along with other funding sources to continue design and planning efforts for 2 to 3 off-stream stormwater detention basins. These basins would provide up to 200 acre-feet of storage capacity annually. Although the results of this completed project would provide quantifiable benefits, we have chosen to leave these benefits unquantified, because of the uncertainty regarding funding and the eventual completion of the project, the complexity involved in accounting for the costs of these additional efforts given the available information, and accounting for the potential that some of these activities could have occurred without the project through other means.

The beneficiaries of this benefit would include local and state taxpayers insofar as the final project would decrease water treatment costs and the area's residents, regional residents, and state residents due to the water quality, salmonid habitat, and carbon sequestering benefits of the project.

B. Klamath WMA

289–Camp Creek Habitat Protection-Road Decommissioning Implementation Project, Karuk Tribe

1. Project Description and Background

The Camp Creek Habitat Protection-Road Decommissioning Implementation Project would remove 16 miles of road in the culturally and ecologically significant Camp Creek Watershed. Without the project, erosion and failure of the roads would continue to contribute sediment to the watershed's salmon-bearing streams, disrupting the ecological and hydrological integrity and connectivity of the watershed. With the project, road-decommissioning would remove unstable fill material, re-establish natural hydrologic patterns, and restore 2.5 acres of upland habitat and 2 stream-miles of riparian habitat with native grasses that would encourage the re-establishment of other native

plants and wildlife. The project funding would also help leverage other sources of funding to accomplish additional sediment-removal and road-decommissioning activities in the watershed.

2. Water-Quality Benefits

This project would create water-quality benefits described below. Table 16-289 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Avoided Costs of Sediment Deposition (Quantifiable). The project would directly remove or stabilize 13,000 cubic yards, or 12,285 tons, of sediment by decommissioning 16 miles of roads in the Camp Creek watershed.[42] The sediment removal would be complete after the 2012 field season, and we assume the full level of annual benefits would begin accruing in 2014. Annual data on the baseline levels (without the project) of sediment deposition from the areas the project would affect into the Camp Creek watershed are unavailable. Because data aren't available to identify what the actual annual rate of deposition would be without the project, we use a conservative estimate. Knowing that unmaintained roads are considered "chronic sediment sources" that "bleed" sediment into a watercourse over time, we assume an equal amount of sediment would deposit into the stream each year, for a period of 10 years, about 1,286 tons per year.

By removing sediment, the project would reduce the potential load of sediment available to deposit into the water bodies within the Camp Creek watershed, and avoid the costs that occur when that sediment deposits into water bodies. We calculate the value of the avoided costs of sediment deposition by multiplying $11.28 per ton,[43] which represents the costs associated with sediment deposition within the North Coast region,[44] by the total tons of sediment removed each year, distributed equally over a 10-year period. This method may underestimate the value of the benefit if, without the project, the total amount of sediment the project would remove would have eroded at a faster rate (more than 1,286 tons per year). It may overestimate the value if, without the project, the sediment would have eroded at a slower annual rate (less than 1,286 tons per year).

The beneficiaries of this benefit would include a broad cross-section of Californians, including downstream domestic, municipal, and agricultural water users who withdraw water from affected water bodies; freshwater and marine recreational and commercial fishermen; people who recreate in and nearby downstream water bodies; and farmers, municipal officials, and other property owners who maintain infrastructure downstream of the project area.

[42] Conversion from cubic yards to sediment assumes 1 cubic yard of sediment equals 0.945 tons (Rice and Sherbin 1977). The U.S. Forest Service has applied this conversion to estimate sediment erosion in watersheds in Northern California.

[43] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

[44] The total costs include costs associated with maintaining irrigation ditches and canals, marine recreational and commercial fishing, freshwater fisheries, flood damage, road drainage ditches, municipal and industrial water use, municipal water treatment, power production, soil productivity, water-based recreation, and navigation. See regional-level benefits section for a description of the methodology and source used to derive this estimate.

Passive-Use Value Associated with Increases in Salmonid Populations (Unquantifiable). By reducing the amount of sediment deposited from existing roads and stream crossings and restoring riparian habitat adjacent to salmon-bearing streams, the project would enhance salmonid habitat in the Camp Creek watershed. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available information. Research suggests, however, that reducing sediment loading in salmon-bearing streams would improve the function of spawning and rearing habitat, which is likely to lead to increases in juvenile salmonid survival and increased salmonid populations (NMFS 2010, CDFGH 2004).

This benefit captures the passive-use value many Californians place on the continued existence of thriving salmon populations within the state. If data were available to quantify this benefit, we would employ a value of $2,000 per additional fish per year as a rough estimate of the passive-use benefit of increased salmon populations.[45]

The beneficiaries of this benefit would be Californians who value the survival of healthy salmon populations in California, but may never fish or directly interact with salmon.

Cultural Value Associated with Increases in Salmon Populations (Unquantifiable). As we describe above, the project would enhance salmonid habitat in the Camp Creek watershed. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available information. Research suggests, however, that reducing sediment loading in salmon-bearing streams would improve the function of spawning and rearing habitat, which is likely to lead to increases in juvenile salmonid survival and increased salmonid populations (NMFS 2010, CDFGH 2004).

This benefit captures the cultural value many Native Americans, including members of the Karuk Tribe, place on the continued existence of thriving salmon populations within the state. Unlike many Californians who ascribe a monetary willingness to pay to protect salmon, even if they never intend to directly fish or watch them, many Native Americans recognize the importance of salmon outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we recognize the cultural significance that arises from the projects' improvements to salmonid populations and their habitat apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include Native American tribal members in the region and other Californians who believe the continued existence of salmonid populations and their habitat is essential to cultural and spiritual well-being.

[45] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

3. Other Benefits

This project would create other benefits described below. Table 16-289 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Passive-Use Value Associated with Increases in Forest Biodiversity (Quantifiable). The project would restore 2.5 acres of upland mixed-conifer/hardwood forest habitat and increase connectivity between existing habitat areas by removing roads. While the project would actively plant native grasses, it likely would provide the opportunity for other native shrubs and trees to re-vegetate the disturbed areas, as past experience with similar restoration projects in the watershed has demonstrated. The increased diversity of plants likely would increase the amount of habitat for other native wildlife. Overall, the project likely would directly increase the biodiversity of the 2.5 restored acres, and potentially also indirectly increase the biodiversity of adjacent habitat.

Data are insufficient to delineate specific impacts of the project's restoration efforts on the ecosystem services provided by this area of riparian habitat. For our analysis, we use a passive use value of $120 per acre of riparian habitat per year to estimate the value of the benefits attributable to riparian restoration.[46] This passive use value estimates how much society would be willing to pay for riparian habitat solely for its existence, aside from any benefits received directly or indirectly from the habitat's function. By only considering passive use, we likely underestimate the total value of the benefits derived from riparian restoration. This value also may underestimate the total value to the extent that it does not account for potential increases in the biodiversity of habitat adjacent to the restored area.

The beneficiaries of this benefit would include Californians who value the existence of forest biodiversity in northern California.

Cultural Value Associated with Increases in Forest Biodiversity (Unquantifiable). The project would restore 2.5 acres of upland mixed-conifer/hardwood forest habitat, and 2 stream miles of riparian habitat with native plant species. While the project would only actively plant native grasses, it likely would provide the opportunity for other native shrubs and trees to re-vegetate the disturbed areas, as past experience with similar restoration projects in the watershed has demonstrated. These native plants, and the native wildlife populations they support, would have higher value for Native American tribes than the existing ecological resources, because the native species have cultural significance to the Karuk people, who use them for their edible, medicinal, and spiritual properties. Unlike many Californians who ascribe a monetary willingness to pay to restore native forests and increase ecological biodiversity, many Native Americans recognize the importance of restoring this native biodiversity outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we identify the cultural significance that arises from the projects' restoration of forest ecosystems apart from the quantified passive-use value or other measures of economic benefits.

[46] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

The beneficiaries of this benefit would include members of the Karuk people and other Native Americans in the region who use and value the existence of native, culturally-important plant and animal species.

Reduced Risk of Introduction and Spread of Invasive Species (Unquantifiable). By decommissioning existing roads, the project would reduce the risk of spreading Port Orford Root Rot fungus (*Phytophthora lateralis*) throughout the Camp Creek Watershed. Vehicle traffic is one way in which Port Orford Root Rot fungus spreads, and reducing the number of vehicles traveling through the watershed each year is likely to reduce the rate of infection in the project area. Reducing the infection rate would impact fewer Port Orford Cedar trees, which are a primary source of shade along streams and provide substrate for biological activity, bank stability, and nutrient uptake. Data are currently unavailable to describe the current infection rate or the potential effect of the project on reducing the infection rate and associated ecological or economic damage.

The beneficiaries of this benefit would include Californians who care about maintaining healthy forest ecosystems.

Potential to Leverage Funds for Additional Sediment Reduction Activities (Unquantifiable). If funded, the project would increase the likelihood that other funds could be leveraged to support the removal of an additional 21,788 cubic yards (20,590 tons) of sediment in the Camp Creek watershed. Although this additional sediment-removal effort would produce quantifiable benefits, we have chosen to leave these benefit unquantified because of uncertainty regarding whether these funds would actually be leveraged, the complexity involved in accounting for the costs of these additional efforts given the available information, and accounting for the possibility that some of these activities could occur without the project through other means.

311–Indian Creek Sewer Pipeline Crossing, Happy Camp Sanitary District

1. Project Description and Background

The Indian Creek Sewer Pipeline Crossing would decommission an existing sewer pipeline that is exposed in the bed of Indian Creek, and replace it with a new sewer pipe crossing. Without the project, there is a high likelihood that the pipeline would fail within 50 years, causing untreated sewage to leak into Indian Creek, which flows into the Klamath River, threatening fish populations, recreation, and other ecosystem services provided by the water bodies. Pipeline damage would also interrupt wastewater collection services for customers within the Happy Camp Sanitary District. With the project, the risk of a sewer pipe failure would be considerably reduced because it would be outside of the 100-year floodplain. This would increase the reliability of the system and help protect the ecosystem services provided by Indian Creek and the Klamath River.

2. Water-Quality Benefits

This project would create water-quality benefits described below. Table 16-311 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Passive-Use Value Associated with Avoiding Harm to Salmon Populations (Unquantifiable). By avoiding a pipeline failure and preventing sewage discharge into Indian Creek, the project would potentially avoid harm to salmon populations in Indian Creek and downstream in the Klamath River. Data are unavailable to estimate the degree to which salmon populations could be harmed from a sewage discharge, however, it would have a greater – and perhaps lethal – impact if it occurred during the summer when flows would be lower and less water would be available to dilute the contamination.

This benefit captures the passive-use value many Californians place on the continued existence of thriving salmon populations within the state. If data were available to quantify this, we would employ a value of $2,000 per additional fish per year as a rough estimate of the passive-use benefit of increased salmon populations.[47]

The beneficiaries of this benefit would be Californians who value the survival of healthy salmon populations in California, but may never fish or directly interact with salmon.

Cultural Value Associated with Avoiding Harm to Salmon Populations (Unquantifiable). By avoiding a pipeline failure and preventing sewage discharge into Indian Creek, the project would potentially avoid harm to salmon populations in Indian Creek and downstream in the Klamath River. Data are unavailable to estimate the degree to which salmon populations could be harmed from a sewage discharge. It would have a greater – and perhaps lethal – impact if it occurred during the summer when flows would be lower and less water would be available to dilute the contamination.

This benefit captures the cultural value many Native American people, including members of the Karuk Tribe, place on the continued existence of thriving salmon populations within the state. Unlike many Californians who ascribe a monetary willingness to pay to protect salmon, even if they never intend to directly fish or watch them, many Native Americans recognize the importance of salmon outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we recognize the cultural significance that arises from the projects' improvements to salmonid populations and their habitat apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include Native American tribal members in the region and other Californians who believe the continued existence of salmonid populations and their habitat is essential to cultural and spiritual well-being.

3. Other Benefits

This project would create other benefits described below. Table 16-311 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

[47] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

Avoided Costs of Administrative Civil Liability Action Fines (Quantifiable). The project would replace the exposed sewer main and move it outside of the 100-year floodplain, reducing the likelihood that it would fail and discharge pollution into Indian Creek and downstream into the Klamath River. The project would avoid the potential cost associated with an unauthorized discharge, which could be as high as $150,000, based on one day of discharge at 60,000 gallons per day. Because project sponsors indicate a pipeline failure is highly likely within the next 50 years, we assume a 2 percent probability of failure in any given year, without the project, to estimate these avoided costs. The fine could be less if the California Regional Water Quality Control Board took into consideration the disadvantaged status of Happy Camp and allowed some of the fine to be put toward repairing the damaged pipeline. This cost would be higher, to the extent that the District would incur additional administrative costs to deal with a fine. Data are unavailable to estimate the annual value of these administrative costs.

The beneficiaries of this benefit would include the Happy Camp Sanitary District ratepayers.

Avoided Costs of Emergency Repairs (Quantifiable). By replacing the pipeline under non-emergency conditions, the project would avoid the costs associated with an emergency repair, which would be higher. Initially, District resources required to stop a leak would cost $5,000 to $15,000 and an additional $5,300 to $15,800 to bypass the leak and restore service to customers. We sum the lower of these values to avoid overestimating the benefits, for a total cost to stop and bypass a leak of $10,300. Under emergency conditions, District operators estimate the cost of a repair would be between 1.25 and 1.67 times more than the costs under normal conditions, taking into account increased competition for materials during post-flood recovery, and expedited design, environmental permitting, and construction schedules. Based on the estimated costs to construct the project, the emergency repair costs would be between $1 million and $1.35 million. Again, we use the lower of these values to estimate the costs, or $1 million in order to avoid overestimation of benefits. The total avoided costs of emergency repairs, then, would be $1,010,300. Because project sponsors indicate a pipeline failure is highly likely within the next 50 years, we assume a 2 percent probability of failure in any given year, without the project, to estimate the annual value of these avoided costs.

The beneficiaries of this benefit would include the Happy Camp Sanitary District ratepayers, if they otherwise would be required to bear the costs of the emergency repairs, or other entities, such as the taxpayers of California or the United States, if funds are secured through an emergency grant program.

Avoided Costs of a Service Disruption (Unquantifiable). By avoiding a pipeline failure, customers of the District would avoid costs associated with a service disruption. The District estimates that completing a bypass of the sewer line under emergency conditions would take between 1 and 5 days to complete. During this time, service to 855 residents (532 billing units) would be directly affected. The existing data are insufficient to estimate the direct and indirect costs associated with

not having access to wastewater services, but research in other places suggests they could be significant (Kunreuther, Cyr, Grossi and Tao 2001).

The beneficiaries of this benefit would include permanent and transitory customers (e.g., visitors to the community who would not have access to wastewater services) of the Happy Camp Sanitary District.

Avoided Disruption of Recreation Activities in Indian Creek (Unquantifiable). By avoiding a pipeline failure and preventing sewage discharge into Indian Creek, the project would avoid a potential disruption of recreation in Indian Creek. The pipeline is located upstream of the confluence of Indian Creek and the Klamath River, which, is one of the most popular whitewater access points in the local area. If the pipeline ruptured, access to the access point could be restricted, and water-contact recreation would be discouraged until bacterial concentrations returned to safe levels. The duration of this disruption would depend on the time of year the rupture occurred and the amount of time it would take to repair the pipeline. The U.S. Forest Service estimates there are 10,500 to 13,500 commercial whitewater rafting user days on the Klamath River, based on user data collected from 2005 to 2009, with the majority of those user days occurring between June and August. The average consumer surplus value of rafting, per person, per day, in the Pacific Coast region is $31.50 (Loomis 2005). Other types of recreation also occur in or adjacent to Indian Creek, including swimming, fishing, hiking, and inner tube floating. Local recreation-guide companies estimate there are 75 to 100 user days each year of fishing, with heaviest usage from August to March; 300 user days each year of swimming, 300 user days each year of day use hiking and picnicking, and 30 to 50 user days each year of inner tube floaters, with the heaviest uses from July to August. The value of these recreation opportunities, per person, per day in the Pacific Coast Region ranges from $30.50 for swimming to $50.00 for fishing (see Table 2.1). To the extent that the sewer pipeline failure causes any of these recreationists to cancel their activities or change their plans, it could reduce the value they derive from the recreational experience and incur costs to find substitute recreational opportunities elsewhere. Insufficient data exist to calculate the value of this potential avoided cost, but it would be higher if the sewage discharge occurred during the summer, when more people recreate in Indian Creek, and less water would be available to dilute the contamination.

The beneficiaries of this benefit would include rafters, swimmers, anglers, and hikers who recreate along Indian Creek in the vicinity of the pipeline and businesses that serve them.

306–Water Treatment System Upgrade, Happy Camp Community Services District

1. Project Description and Background

The Happy Camp Water Treatment System Upgrade would replace critical infrastructure for the water treatment system in Happy Camp, including adding a new filtration system and relocating electrical equipment out of the 100-year floodplain. Without the project, Happy Camp's water system would be out of compliance with federal and state drinking water rules when the State of California adopts EPA's new Long-Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR), and

vulnerable to failure in the event of a flood. With the project, the water system would comply with the new LT1ESWTR, provide higher-quality water to its customers, and would be less susceptible to failure during flood events.

2. Water-Quality Benefits

This project would create water-quality benefits described below. Table 16-306 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Avoided Costs of Non-Compliance with Drinking Water Regulations (Quantifiable). The project would install filtration equipment sufficient to meet the LT1ESWTR standards for removing *Cryptosporidium*, a water-borne pathogen. By doing so, it would bring the water-system into compliance with the LT1ESWTR, when it is adopted by the state. If the system were not in compliance when the state adopts the LT1ESWTR, the state would issue the Happy Camp Community Services District a compliance order, which would cost the District $200 to $400 per order. If the District refused or was unable to initiate compliance activities, the state could further fine the District $200 to $1,000 per day. The likelihood of the state actually levying the non-compliance fines is low, as it tends to work directly with Districts, especially those in disadvantaged communities, to work towards compliance, rather than spending funds on fines. Given this likelihood, we estimate the avoided cost of non-compliance at $200 per year, assuming one non-compliance order per year.

The beneficiaries of this benefit would include the Happy Camp Community Services District ratepayers.

Increased Quality of Drinking Water (Unquantifiable). The project would improve the quality of water delivered to customers by installing new filtration equipment to comply with the LT1ESWTR. The purpose of the LT1ESWTR is to improve the control of microbial pathogens, such as *Cryptosporidium*, and potentially reduce the risk of illness. The reduction in risk of illness from complying with the LT1ESWTR has not been quantified, but the Environmental Protection Agency and the California Department of Health Services have indicated that it would provide benefits by reducing the costs associated with illness from water-borne pathogens, primarily *Cryptosporidium* (US EPA 2002).

The beneficiaries of this benefit would include the permanent and transitory customers (e.g., visitors to the community who would not have access to water or services dependent on water) of the Happy Camp Community Services District.

C. North Coast Rivers WMA

408–Del Norte Agricultural Enhancement Program, Del Norte Resource Conservation District

1. Project Description and Background

The Del Norte Agricultural Enhancement Program would assist dairies in the Smith River watershed upgrade their facilities, improving their methods for collecting, storing, treating, and using manure-based wastewater. Without facility upgrades, these dairies would be in non-compliance with upcoming regulations under the Clean Water Act. Without the project, the dairies would either upgrade their facilities with their own funds, when and if they become available in the future, or incur fees and potential penalties for noncompliance. In our analysis, we assume these dairies would not upgrade their facilities. Pathogen and pollutant-contaminated wastewater would continue to discharge into the Smith River watershed, reducing the quality of recreation, wildlife habitat, and increasing costs for downstream users to treat water and comply with regulations. With the project, the waste-dairies would install waste-management systems, which would reduce pathogens and other pollutants in the Smith River watershed, improving the quality of recreation and wildlife habitat, and reducing the costs for downstream water users and regulators charged with enforcing water-quality and dairy-waste-management regulations.

2. Water-Quality Benefits

This project would create water-quality benefits described below. Table 16-408 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Avoided Cost of Non-Compliance (Quantifiable). The project would upgrade the facilities at three dairies in the area to meet new, more stringent, wastewater runoff regulations to be implemented in the coming years. We assume that, but for the proposed project, these dairies would not upgrade their wastewater facilities, but rather, would pay annual fees of $2,352 per dairy for noncompliance, starting in 2015. With the project, the dairy owners would avoid these costs. The project may also allow dairies to avoid more stringent penalties for violating waste-management regulations. The U.S. Environmental Protection Agency could assess penalties of up to $27,500 per day, per violation and assess an administrative penalty of up to $11,000 per day for each day during which the violation continues, with a maximum of $137,500 in total penalties. Project sponsors suggest that, while these penalties could occur, it is unlikely that they would be assessed in this situation, so we do not assume these costs would be avoided with the project, potentially underestimating the actual benefit of avoided costs of non-compliance. This benefit is also underestimated to the extent that the project would allow state and federal regulators to avoid costs associated with enforcing non-compliance fees and penalties on these dairies. Data are not available to quantify the value of this avoided cost.

The beneficiaries of this benefit would include the dairy owners insofar as they avoid paying future penalties for noncompliance, and state and federal taxpayers insofar as fewer resources would be spent enforcing noncompliance fees on these dairies.

Avoided Water-Treatment and Compliance Costs for Downstream Water Users (Unquantifiable). By improving the capacity of three dairies to collect, store, treat, and use manure-based wastewater, the project would reduce the amount of coliform bacteria and other harmful pollutants entering into the Smith River watershed, improving the water quality throughout the watershed. Reducing the amount of pathogens, excessive nutrients, and other harmful pollutants that enter waterways from dairy runoff would produce many economic benefits for downstream water users, including reduced costs associated with water-quality management and meeting regulatory water-quality goals, reducing water-treatment costs, and reducing the risk associated with illness from contact with contaminated water. Data are insufficient to quantify the avoided water-treatment costs, or the avoided costs of complying with water-quality regulations that would arise from this project.

The beneficiaries of this benefit would include water-management agencies, landowners, and state and federal taxpayers, insofar as the project would result in less time and fewer resources spent on future management of water quality.

Passive-Use Value Associated with Increases in Salmonid Populations (Unquantifiable). By improving the water quality in salmon-bearing streams, the project would enhance salmonid habitat in the Smith River watershed. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available information. Research suggests, however, that improvements in water quality and water quantity as provided by this project would improve the function of spawning and rearing habitat, potentially leading to increases in juvenile salmonid survival and increased salmonid populations (NMFS 2010, CDFGH 2004).

This benefit captures the passive-use value many Californians place on the continued existence of thriving salmon populations within the state. If data were available to quantify this, we would employ a value of $2,000 per additional fish per year as a rough estimate of the passive-use benefit of increased salmon populations.[48]

The beneficiaries of this benefit would be Californians who value the survival of healthy salmon populations in California, but may never fish or directly interact with salmon.

Cultural Value Associated with Increases in Salmon Populations (Unquantifiable). By improving the water quality in salmon-bearing streams, the project would enhance salmonid habitat in the Smith River watershed. Direct, quantitative linkages between the project and salmon-related benefits,

[48] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

such as an increase in salmonid populations, are impossible to identify, given the available information. Research suggests, however, that improvements in water quality and water quantity as provided by this project would improve the function of spawning and rearing habitat, potentially leading to increases in juvenile salmonid survival and increased salmonid populations (NMFS 2010, CDFGH 2004).

This benefit captures the cultural value many Native Americans place on the continued existence of thriving salmon populations within the state. Unlike many Californians who ascribe a monetary willingness to pay to protect salmon, even if they never intend to directly fish or watch them, many Native Americans recognize the importance of salmon outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we recognize the cultural significance that arises from the projects' improvements to salmonid populations and their habitat apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include Native American tribal members in the region and other Californians who believe the continued existence of salmonid populations and their habitat is essential to cultural and spiritual well-being.

Increased Quality of Recreation (Unquantifiable). By reducing the amount of dairy-related pathogens and other pollutants from entering the Smith River, the project would improve the quality of recreation for people who fish, swim, boat, and otherwise enjoy the River. To the extent that the project lowers the risk of contracting an illness from water-contact recreation, it could produce economic benefits. For example, a study of the public-health costs of bacterial contamination of public beaches in Southern California suggests that swimmers are willing to pay between $42 and $350 to avoid getting sick from swimming in contaminated water (Given, Pendleton and Boehm 2006). The higher end of this range represents both market and non-market costs associated with gastro-intestinal (GI) illness, including loss of time at work, medical expenses, and the psychological impacts of getting sick, while the lower estimate only includes market costs associated with water-borne GI infections. To the extent that the project reduce the amount of nutrients in the water and increases the clarity and quality of the water, it could improve the success and experience of swimming, boating, and angling. Data are insufficient to quantify the water-quality improvements that the project would provide, or to describe the amount of improvement in recreation the project could create.

The beneficiaries of this benefit would include people who use the Smith River for swimming, boating, fishing, and other water-contact or near-water recreation.

352–Gualala River Sediment Reduction Program, Gualala River Watershed Council

1. Project Description and Background

The Gualala River Sediment Reduction Program would address sediment erosion on 12 miles of roads within the Gualala River watershed, implement salmonid habitat improvements, and provide

educational forums and information for landowners and others to learn about conservation and restoration practices. Without the project, sediment would deposit into salmon-bearing streams and adversely affect salmonid populations, and stream reaches in the Gualala River would provide lower-quality habitat for salmonids. With the project, sediment would be removed or stabilized, reducing the overall amount entering the watershed's water bodies. salmonid habitat would be improved through restoration projects that introduce large woody debris into the stream channels. . The placement of large wood in the basin is planned using a phased approach to replicate the natural recruitment process. Wood would be placed on an annual basis to reproduce (at an accelerated rate) the natural spatial patterns of large wood abundance across a channel network. Property owners and land managers would be empowered with information to more effectively address sources of water pollution and other conditions that adversely affect the region's water bodies.

2. Water-Quality Benefits

This project would create water-quality benefits described below. Table 16-352 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Avoided Costs of Sediment Deposition (Quantifiable). The project would directly remove or stabilize 30,000 cubic yards, or 28,200 tons, of sediment by decommissioning 12 miles of roads in the Gualala River watershed.[49] The sediment removal would be complete after the 2012 field season, and we assume the full level of annual benefits would begin accruing in 2014. Annual data on the baseline levels (without the project) of sediment deposition from the areas the project would affect into the Gualala River watershed are unavailable. Because data aren't available to identify what the actual annual rate of deposition would be without the project, we use a conservative estimate. Knowing that unmaintained roads are considered "chronic sediment sources" that "bleed" sediment into a watercourse over time, we assume an equal amount of sediment would deposit into the stream each year, for a period of 10 years, about 2,820 tons per year.

By removing sediment, the project would reduce the potential load of sediment available to deposit into the water bodies within the Gualala River watershed, and avoid the costs that occur when that sediment deposits into water bodies. We calculate the value of the avoided costs of sediment deposition by multiplying $11.28 per ton, which represents the costs associated with sediment deposition within the North Coast region,[50] by the total tons of sediment removed each year, distributed equally over a 10-year period. This method may underestimate the value of the benefit if, without the project, the total amount of sediment the project would remove would have eroded

[49] Conversion from cubic yards to sediment assumes 1 cubic yard of sediment equals 0.945 tons (Rice and Sherbin 1977). The U.S. Forest Service has applied this conversion to estimate sediment erosion in watersheds in Northern California.

[50] The total costs include costs associated with maintaining irrigation ditches and canals, marine recreational and commercial fishing, freshwater fisheries, flood damage, road drainage ditches, municipal and industrial water use, municipal water treatment, power production, soil productivity, water-based recreation, and navigation. See regional-level benefits section for a description of the methodology and source used to derive this estimate.

at a faster rate (more than 2,820 tons per year). It may overestimate the value if, without the project, the sediment would have eroded at a slower annual rate (less than 2,820 tons per year).

The beneficiaries of this benefit would include a broad cross-section of Californians, including downstream domestic, municipal, and agricultural water users who withdraw water from affected water bodies; freshwater and marine recreational and commercial fishermen; people who recreate in and nearby downstream water bodies; and farmers, municipal officials, and other property owners who maintain infrastructure downstream of the project area.

Passive-Use Value Associated with Increases in Salmonid Populations (Quantifiable). By reducing the amount of sediment deposited from existing roads and stream crossings in salmon-bearing streams, improving the structural complexity of salmonid habitat by increasing the amount of woody debris in the stream, and enhancing fish passage to the upper reaches of the watershed, the project would increase salmonid populations in the Gualala River watershed. Surveys of fish in the watershed and past experience with similar restoration projects suggests that the project could increase coho and steelhead populations in the project area by 20 percent over a period of 5 years. Based on current population estimates, this would ultimately lead to an increase of 536 salmonids after 5 years. Project sponsors estimate that about 10 percent of those fish would be coho and 90 percent would be steelhead.

This benefit captures the passive-use value many Californians place on the continued existence of thriving salmon populations within the state. To calculate this benefit, we multiply a value of $2,000 per additional fish the project would generate, per year as a rough estimate of the passive-use benefit of increased salmon populations.[51]

The beneficiaries of this benefit would be Californians who value the survival of healthy salmon populations in California, but may never fish or directly interact with salmon.

Cultural Value Associated with Increases in Salmon Populations (Unquantifiable). By reducing the amount of sediment deposited from existing roads and stream crossings in salmon-bearing streams, improving the structural complexity of salmonid habitat by increasing the amount of woody debris in the stream, and enhancing fish passage to the upper reaches of the watershed, the project would increase salmonid populations in the Gualala River watershed. Surveys of fish in the watershed and past experience with similar restoration projects suggests that the project could increase coho and steelhead populations in the project area by 20 percent over a period of 5 years. Based on current population estimates, this would ultimately lead to an increase of 536 salmonids after 5 years. Project sponsors estimate that about 10 percent of those fish would be coho and 90 percent would be steelhead.

[51] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

This benefit captures the cultural value many Native Americans place on the continued existence of thriving salmon populations within the state. Unlike many Californians who ascribe a monetary willingness to pay to protect salmon, even if they never intend to directly fish or watch them, many Native Americans recognize the importance of salmon outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we recognize the cultural significance that arises from the projects' improvements to salmonid populations and their habitat apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include Native American tribal members in the region and other Californians who believe the continued existence of salmonid populations and their habitat is essential to cultural and spiritual well-being.

3. Other Benefits

This project would create other benefits described below. Table 16-352 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Avoided Costs of Road Maintenance (Quantifiable). The project would improve or decommission 12 miles of road, which would otherwise need ongoing maintenance associated with deteriorating roads. Without the project, these maintenance costs are estimated to escalate by 5 percent per year. Based on the estimated construction costs for the sediment-reduction portions of the project (about $600,000), the avoided costs in the first year would be about $30,000, and would continue to rise by 5 percent each year. They likely would not rise indefinitely, as eventually without the project, the roads would be permanently repaired or decommissioned. We estimate this benefit for a period of 10 years.

The beneficiaries of this benefit would include land managers and other property owners responsible for the maintenance of the roads the project would address.

Enhanced Human and Social Capital (Unquantifiable). The project's education activities, including educational forums and newsletters, would increase the human capital in the region by increasing the level of technical knowledge land owners and land managers have to apply to solving water quality problems in the Gualala River watershed. The educational forums and newsletters would increase the social capital in the region by providing an opportunity and platform for land owners and land managers to connect with each other, build trust, and share information. These efforts could allow the community to more efficiently and effectively solve problems and make decisions that affect the environmental and social health within the watershed. Data are unavailable to quantify the economic benefits arising from these effects, but they are likely to lead to lower costs of management for land managers and land owners, or the production of additional water quality and salmon-related benefits, similar to those discussed above

The beneficiaries of this benefit would include land owners and land managers within the Gualala River watershed, and the communities in which they reside.

444–Mattole Integrated Watershed Management Initiative, Mattole Restoration Council

1. Project Description and Background

The Mattole Integrated Watershed Management Initiative would install seven 50,000-gallon water-storage systems in the upper mainstream Mattole River, negotiate forbearance agreements with six private landowners to increase instream flow during periods of low flow, implement water efficiency improvements, leak-detection, and overflow prevention resulting in 311,500 gallons (0.96 acre-feet) of decreased water use per year, remove invasive vegetation from 12.5 acres of riparian habitat, restore a total of 50 acres of riparian habitat, prevent the deposition of 1,500 cubic yards of sediment per year, and implement a coho rearing program. Without the project, invasive vegetation would continue to spread across the landscape, reducing the ability of native plants and wildlife to thrive. Water users would continue to withdraw water from the Mattole River, even during periods of seasonal low flow (July to September), decreasing the quality of aquatic habitat and integrity of salmon populations in the area. The current state of coho salmon in the Mattole is so imperiled than not implementing the project would likely lead to the extirpation of the Mattole population. With the project, the quality of riparian and aquatic habitat in the area would improve, less sediment would erode into the River, and salmon populations would increase due to improved riparian and in-stream habitat, increased instream flow, and the implementation of a coho rearing program.

2. Water-Quality Benefits

This project would create water-quality benefits described below. Table 16-444 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Avoided Cost of Sediment Deposition (Quantifiable). The project would prevent 1,500 cubic yards, or 1,418 tons, of sediment from eroding into the Mattole River and its tributaries each year.[52] We calculate the value of the avoided costs of sediment deposition by multiplying the number of tons the project would avoid each year by $11.28 per ton, which represents the costs associated with sediment deposition in the Northern California.[53] The project would produce these benefits in perpetuity.

The beneficiaries of this benefit would include individuals participating in water-based recreation, by increasing water quality, local and downstream residents by reducing the potential costs of future flood damage, marine and freshwater commercial and recreational fisheries by potentially increasing catch rates stemming from improved water quality and aquatic habitat conditions, agricultural water users by decreasing resources spent on maintaining irrigation ditches, and local

[52] Conversion from cubic yards to sediment assumes 1 cubic yard of sediment equals 0.945 tons (Rice and Sherbin 1977). The U.S. Forest Service has applied this conversion to estimate sediment erosion in watersheds in Northern California.

[53] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

and state taxpayers by decreasing time and resources spent on maintaining road drainage ditches and treating municipal water.

Passive-Use Value Associated with Increases in Salmonid Populations (Quantifiable). By improving riparian function, increasing instream flow, and initiating a coho rearing program, the project likely would increase the salmon population in the Mattole River. Project sponsors estimate that improving riparian function and increasing instream flow would increase returning adult salmon populations in the Mattole River by 100 and that the coho rearing program would yield an additional 140 adult salmon, for a total of 240 adult salmon.[54]

This benefit captures the passive-use value many Californians place on the continued existence of thriving salmon populations within the state. We estimate the value of the passive-use benefits associated with this increase in salmon populations by employing a value of $2,000 per additional fish per year.[55]

The beneficiaries of this benefit would be Californians who value the survival of healthy salmon populations in California, but may never fish or directly interact with salmon.

Cultural Value Associated with Increases in Salmon Populations (Unquantifiable). By improving riparian function, increasing instream flow, and initiating a coho rearing program, the project likely would increase the salmon population in the Mattole River. Project sponsors estimate that the project would increase salmon populations in the Mattole River by 240 adult salmon.

This benefit captures the cultural value many Native American people, including local tribes, place on the continued existence of thriving salmon populations within the state. Unlike many Californians who ascribe a monetary willingness to pay to protect salmon, even if they never intend to directly fish or watch them, many Native Americans recognize the importance of salmon outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we recognize the cultural significance that arises from the projects' improvements to salmonid populations and their habitat apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include Native American tribal members in the region and other Californians who use and value the continued existence of salmonid populations and their habitat.

[54] The coho rearing program would release 7,500 smolt each year. With data from a similar program implemented in the Mad River, we estimate that the coho rearing program in the Mattole River would increase adult salmon populations by 32 salmon after the first year, 103 salmon in the second year, and 140 salmon in the third year. The increase in salmon populations would then stabilize at 140 salmon above the baseline level into the future.

[55] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

3. Other Benefits

This project would create other benefits described below. Table 16-444 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Passive-Use Value Associated with Increases in Forest Biodiversity (Quantifiable). The project would remove invasive vegetation from 12.5 acres of riparian habitat and would restore a total of 50 acres of riparian habitat by planting native vegetation such as trees, shrubs, and grasses, promoting species diversity and riparian function. This restoration would be beneficial to terrestrial and avian wildlife by improving habitat conditions in the watershed. It would also improve several water quality and water quantity characteristics in the adjacent Mattole River. These water-based improvements enhance the quality of aquatic habitat in Mattole River.

Data are insufficient to delineate specific impacts of the project's restoration efforts on the ecosystem services provided by this area of riparian habitat. For our analysis, we use a passive use value of $120 per acre of riparian habitat per year to estimate the value of the benefits attributable to riparian restoration.[56] This passive use value estimates how much society would be willing to pay for riparian habitat solely for its existence, aside from any benefits received directly or indirectly from the habitat's function. By only considering passive use, we likely underestimate the total value of the benefits derived from riparian restoration. This value also may underestimate the total value, to the extent that it does not account for potential increases in the biodiversity of habitat adjacent to the restored area.

The beneficiaries of this benefit would include Californians who value the existence of forest biodiversity in northern California.

Cultural Value Associated with Increases in Forest Biodiversity (Unquantifiable). The project would remove invasive vegetation from 12.5 acres of riparian habitat and would restore a total of 50 acres of riparian habitat by planting native vegetation such as trees, shrubs, and grasses, promoting species diversity and riparian function. This restoration would be beneficial to terrestrial and avian wildlife by improving habitat conditions in the area. It would also improve several water quality and water quantity characteristics in the adjacent Mattole River. These water-based improvements enhance the quality of aquatic habitat in Mattole River.

These native plants, and the native wildlife populations they support, would have higher value for Native American tribes than the existing ecological resources, because the native species have cultural significance to Native Americans, who use them for their edible, medicinal, and spiritual properties. Unlike many Californians who ascribe a monetary willingness to pay to restore native forests and increase ecological biodiversity, many Native Americans recognize the importance of restoring this native biodiversity outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we identify the cultural significance that arises

[56] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

from the projects' restoration of forest ecosystems apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include Native Americans in the region and beyond who use and value the existence of native, culturally-important plant and animal species.

Avoided Cost of Carbon Dioxide Emissions (Quantifiable). The project would remove invasive plant species from 12.5 acres of riparian habitat and would plant native vegetation across 50 acres of riparian habitat including trees, shrubs, and grasses geared toward improving riparian function. This change in vegetation likely would increase the amount of carbon sequestered in the area. For our analysis, we assume the project would sequester 70.8 to 105 tons of carbon dioxide per year, depending on the year and the age of the stand.[57] The actual amount of sequestered carbon dioxide is dependent on many variables including but not limited to the precise mix of species planted, the density of the saplings, the age of the saplings, climate patterns, and the surrounding vegetation and land uses.

By sequestering carbon dioxide that would otherwise be released into the atmosphere, the project would, in a small way, reduce or delay potentially harmful costs associated with climate change. We use a middle value from the literature to estimate the social cost of carbon dioxide at $32.49/ton of carbon dioxide in 2009. We assume this value increases, in real terms, by 2.5 percent per year.[58]

Insofar as the carbon sequestration accomplished by this project reduces the potential negative impacts of climate change, beneficiaries of this benefit would include all residents in California, indeed the entire global population.

Avoided Costs of Water Adjudication (Quantifiable). By achieving the benefits and approaching water-quality and quantity improvements through the strategies proposed in this project, the project sponsors expect to avoid the costs of other regulatory actions. Staff of California Fish and Game and the State Water Resources Control Board have expressed views that project's voluntary forbearance agreement could substantially reduce the need for an adjudication of streamflows in the watershed. Based on these assumptions, that an adjudication would take approximately 7 years to develop (a conservative estimate), litigation fees by litigants and the state would average $300,000 per year for 7 years, and the costs of a watermaster to enforce water use for 15 years, an adjudication could cost well over $2 million. Assuming this project reduces the time and effort involved in an adjudication by just half of this effort, the benefit would be around $1 million. To avoid overestimating the benefit, we assume these costs would occur, without the project, in 10 years, and would last for a period of 10 years.

[57] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

[58] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

The beneficiaries of this benefit would include state and federal regulators, taxpayers, and water users who incur lower legal and enforcement costs associated with adjudication.

Avoided Costs of Regulatory Enforcement (Unquantifiable). By achieving the benefits and approaching water-quality and quantity improvements through the strategies proposed in this project, the project sponsors expect to avoid the costs of other regulatory actions. Other regulatory and legal enforcement action the project could delay, avoid, or reduce, include regulatory-based TMDL implementation for sediment and temperature, a captive broodstock program for coho salmon, and a watershed-wide noxious weed eradication program. The project sponsor estimates, based on discussions with North-Coast Regional Water Quality Control Board Staff, that a regulatory-based TMDL implementation program for sediment and temperature would cost $4.2 million. Based on similar programs in the Scott Creek and Russian River drainages, the project sponsor estimates that the annual cost of a captive broodstock program could cost $750,000 per year. The Mattole Restoration Council has previously estimated that a watershed-wide noxious weed eradication program could cost $900,000 over 15 years. The project is unlikely to accomplish the same scale of effects as these broad-level watershed-wide programs, but it could delay the need for such programs, or incrementally lower the costs associated with implementation. Data are unavailable to estimate with certainty by how much the project could reduce these costs, so we leave them unquantified.

The beneficiaries of this benefit would include state and federal regulators and taxpayers that incur lower regulatory and enforcement costs, and landowners and local jurisdictions that incur lower costs associated with complying with regulations.

Increased Quantity of Recreation (Unquantifiable). By increasing instream flow during typically-dry summer months, the project would increase the number of days in which individuals can participate in water-based recreation along the Mattole River. Project sponsors estimate the project would increase the water-based recreation season by 30 days each year. Research suggests that the consumer surplus associated with various water-based recreation activities in the Pacific Coast region ranges from $30.50 for swimming to $50.00 for fishing, per person per day (Loomis 2005). Data are insufficient to estimate the increase in recreation-days experienced due to the project, but it is reasonable to assume that, if the area is currently used for recreation, it would be used more if water was available throughout the summer.

The beneficiaries of this benefit would include rafters, swimmers, anglers, and hikers who recreate along the Mattole River.

358–Mendocino Headwaters Integrated Water Quality Enhancement Project, Mendocino County RCD

1. Project Description and Background

The Mendocino Headwaters Integrated Water Quality Enhancement project would implement water quality enhancement projects in three watersheds: the Little North Fork Big River; the Upper

Rancheria Creek sub basin of the Navarro River; and the Upper Mainstem Russian River. Without the project, five invasive plant species would continue to spread in the riparian zone on the upper mainstem of the Russian River, which would threaten the viability of riparian corridors. Five stream crossings would impede fish passage and contribute to sediment deposition within the watershed. With the project, salmonids would have access to an additional 1.26 miles of suitable habitat, a total of 6,814 cubic yards of sediment would be removed from the Little North Fork Big River and Upper Rancheria Creek, and the upper mainstem of the Russian River would enjoy an additional two acres of riparian habitat. This restored habitat is located on the Yokayo Rancheria, a disadvantaged community that would greatly benefit from planned riparian restoration plantings with culturally significant plants.

2. Water-Quality and Other Benefits

This project would create water-quality benefits described below. Table 16-358 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Avoided Costs of Sediment Deposition (Quantifiable). The project would directly remove or stabilize 6,814 cubic yards, or 6,439 tons, of sediment from the project area.[59] The sediment removal would be complete in 2012, so we assume benefits would begin accruing in 2013. Annual data on the baseline levels (without the project) of sediment deposition from the areas the project would affect into the Navarro River watershed are unavailable. Because data aren't available to identify what the actual annual rate of deposition would be without the project, we assume an equal amount of sediment would deposit into the stream each year, for a period of 10 years, about 644 tons per year.

By removing sediment, the project would reduce the potential load of sediment available to deposit into the water bodies within the Navarro River watershed, and avoid the costs that occur when that sediment deposits into water bodies. We calculate the value of the avoided costs of sediment deposition by multiplying $11.28 per ton, which represents the costs associated with sediment deposition within the North Coast region,[60] by the total tons of sediment removed each year, distributed equally over a 10-year period. This method may underestimate the value of the benefit if, without the project, the total amount of sediment the project would remove would have eroded at a faster rate (more than 644 tons per year). It may overestimate the value if, without the project, the sediment would have eroded at a slower annual rate (less than 644 tons per year).

[59] Conversion from cubic yards to sediment assumes 1 cubic yard of sediment equals 0.945 tons (Rice and Sherbin 1977). The U.S. Forest Service has applied this conversion to estimate sediment erosion in watersheds in Northern California.

[60] The total costs include costs associated with maintaining irrigation ditches and canals, marine recreational and commercial fishing, freshwater fisheries, flood damage, road drainage ditches, municipal and industrial water use, municipal water treatment, power production, soil productivity, water-based recreation, and navigation. See regional-level benefits section for a description of the methodology and source used to derive this estimate.

The beneficiaries of this benefit would include a broad cross-section of Californians, including downstream domestic, municipal, and agricultural water users who withdraw water from affected water bodies; freshwater and marine recreational and commercial fishermen; people who recreate in and nearby downstream water bodies; and farmers, municipal officials, and other property owners who maintain infrastructure downstream of the project area.

Passive-Use Value Associated with Increases in Salmonid Populations (Unquantifiable). Pacific Watershed Associates estimates that the project would make 1.26 miles of fish passage for migratory salmonids available after completion. It is difficult to predict how much of an increase in fish populations will result from project implementation. Additionally, other species—including frogs, turtles, and salamanders—will also benefit, however, no population or distribution data are currently available for these animals.

This benefit captures the passive-use value many Californians place on the continued existence of thriving salmon populations within the state. If data were available to quantify this benefit, we would employ a value of $2,000 per additional fish per year as a rough estimate of the passive-use benefit of increased salmon populations.[61]

The beneficiaries of this benefit would be Californians who value the survival of healthy salmon populations in California, but may never fish or directly interact with salmon.

Cultural Value Associated with Increases in Salmon Populations (Unquantifiable). Pacific Watershed Associates estimates that the project would make 1.26 miles of fish passage for migratory salmonids available after completion. It is difficult to predict how much of an increase in fish populations will result from project implementation. Additionally, other species—including herpetofauna such as frogs, turtles, and salamanders—will also benefit, however, no population or distribution data are currently available for these animals..

This benefit captures the cultural value many Native Americans place on the continued existence of thriving salmon populations within the state. Unlike many Californians who ascribe a monetary willingness to pay to protect salmon, even if they never intend to directly fish or watch them, many Native Americans recognize the importance of salmon outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we recognize the cultural significance that arises from the projects' improvements to salmonid populations and their habitat apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include Native American tribal members in the region and other Californians who believe the continued existence of salmonid populations and their habitat is essential to cultural and spiritual well-being.

[61] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

Reduced Operations and Maintenance Costs (Unquantifiable). The Mendocino County RCD anticipates lower costs for maintenance and monitoring and the potential of water quality improvements as a result of the project's suppression of sediment delivery. These improvements could result in a decline of annual maintenance costs of up to 50 percent. Data are unavailable to quantify the actual amount of operations and maintenance costs the project would avoid, so we leave this benefit unquantified.

The beneficiaries of this benefit would include the operators and ratepayers of the Mendocino County RCD.

3. Other Benefits

This project would create other benefits described below. Table 16-358 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Passive-Use Value Associated with Increases in Forest Biodiversity (Quantifiable). The project would remove invasive vegetation from two acres of riparian habitat and replace it with native plant species, promoting species diversity and riparian function. This restoration would benefit terrestrial, aquatic, and avian wildlife by improving habitat conditions in the watershed. Improved aquatic habitat would increase fish populations and would improve the health of individual fish in the creek.

Data are insufficient to delineate specific impacts of the project's restoration efforts on the ecosystem services provided by this area of riparian habitat. For our analysis, we use a passive use value of $120 per acre of riparian habitat per year to estimate the value of the benefits attributable to riparian restoration.[62] This passive use value estimates how much society would be willing to pay for riparian habitat solely for its existence, aside from any benefits received directly or indirectly from the habitat's function. By only considering passive use, we likely underestimate the total value of the benefits derived from riparian restoration. This value also may underestimate the total value, to the extent that it does not account for potential increases in the biodiversity of habitat adjacent to the restored area.

The beneficiaries of this benefit would include Californians who value the existence of forest biodiversity in northern California.

Cultural Value Associated with Increases in Forest Biodiversity (Unquantifiable). The project would remove invasive vegetation from two acres of riparian habitat and replace it with native plant species, promoting species diversity and riparian function. This restoration would benefit terrestrial, aquatic, and avian wildlife by improving habitat conditions in the watershed. Improved aquatic habitat would increase fish populations and would improve the health of individual fish in the creek. The suite of riparian plants installed would include important cultural plants, including those traditionally used for basket weaving. The project's riparian restoration would include a number of

[62] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

tribal members of the Yokayo Rancheria. The Rancheria has planted sedge beds to grow and harvest plants for basket weaving and hopes to develop a market amongst other tribes and sell the sedge to basket weavers.

Unlike many Californians who ascribe a monetary willingness to pay to restore native forests and increase ecological biodiversity, many Native Americans recognize the importance of restoring this native biodiversity outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we identify the cultural significance that arises from the projects' restoration of forest ecosystems apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include members of the Yokayo Rancheria who would grow and harvest plants for basket weaving, and other Native Americans in the region who believe the existence of native, culturally-important plant and animal species is essential to cultural and spiritual well-being.

355–Real-Time Weather Data for Irrigation Water Management, Del Norte Resource Conservation District

1. Project Description and Background

The Real-Time Weather Data for Irrigation Water Management project would install a California Irrigation Management Information System (CIMIS) station in Del Norte County. The station would make data on evapotranspiration and other local climatic data available to the public and accessible through the internet. Without the project, irrigators would make decisions about irrigation water use without access to real-time data on local climatic conditions relevant to estimating crop-water needs. With the project, irrigators would have access to such information, and would be able to make more-informed decisions about when and how much to irrigate. This would lead to less water withdrawn and used for irrigation each year from the Smith River watershed.

2. Water-Quality Benefits

This project would create water-quality benefits described below. Table 16-355 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Passive-Use Value Associated with Increases in Salmonid Populations (Unquantifiable). To the extent that the project increases instream flows in the Smith River watershed, it could enhance salmon habitat. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available information. Research suggests, however, that improvements in water quality and water quantity as provided by this project could improve the function of spawning and rearing habitat, potentially leading to increases in juvenile salmonid survival and increased salmonid populations (NMFS 2010, CDFGH 2004).

This benefit captures the passive-use value many Californians place on the continued existence of thriving salmon populations within the state. If data were available to quantify this benefit, we would employ a value of $2,000 per additional fish per year as a rough estimate of the passive-use benefit of increased salmon populations.[63]

The beneficiaries of this benefit would be Californians who value the survival of healthy salmon populations in California, but may never fish or directly interact with salmon.

Cultural Value Associated with Increases in Salmon Populations (Unquantifiable). To the extent that the project increases instream flows in the Smith River watershed, it could enhance salmon habitat. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available information. Research suggests, however, that improvements in water quality and water quantity as provided by this project could improve the function of spawning and rearing habitat, potentially leading to increases in juvenile salmonid survival and increased salmonid populations (NMFS 2010, CDFGH 2004).

This benefit captures the cultural value many Native Americans place on the continued existence of thriving salmon populations within the state. Unlike many Californians who ascribe a monetary willingness to pay to protect salmon, even if they never intend to directly fish or watch them, many Native Americans recognize the importance of salmon outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we recognize the cultural significance that arises from the projects' improvements to salmonid populations and their habitat apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include Native American tribal members in the region and other Californians who believe the continued existence of salmonid populations and their habitat is essential to cultural and spiritual well-being.

441–Waterfall Gulch Transmission Main Project, City of Fort Bragg

1. Project Description and Background

The Waterfall Gulch Transmission Main project would replace the 50-year-old Waterfall Gulch Raw Water Transmission Main with a new larger diameter 5,400 lineal feet of 10-inch PVC C900 Class 235 pipe. Without the project, the City of Fort Bragg (City) will continue to lose water with increasing frequency and severity through cracks and leaks in the water main line, at a conservative rate of 15,000 gallons per day of treated water. With the project, the City would no longer lose water to leaks and would obtain more water from the Waterfall Gulch supply, which is of higher quality and relies on gravity-flow power rather than electrical pumps.

[63] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

2. Water-Quality Benefits

This project would create water-quality benefits described below. Table 16-441 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Avoided Costs Associated with Reduction in Sediment (Unquantifiable). The City expects to see a reduction in sediment from the intake. If there are cracks or breaks in the raw water transmission line in an area of low lying water, some of that water would be sucked into the raw water line during transmission, thereby carrying additional sediment to the treatment facility. Water that does not enter into the transmission line flows into the overflow pipe and then down a natural drainage creek. This overflow both creates and carries a certain amount of sediment runoff into the creek. The project would reduce this sediment discharge by allowing the City to capture a larger volume of water through the transmission line. The quantity of sediment reduction is not quantifiable.

By removing sediment, the project would reduce the potential load of sediment available to deposit into the water bodies within the Noyo watershed, and avoid the costs that occur when that sediment deposits into water bodies. While data are not available, for illustrative purposes, the avoided costs of sediment deposition is $11.28 per ton, which represents the costs associated with sediment deposition in the North Coast region.[64] This value includes benefits such as reductions in the cost of municipal water treatment and increases in soil productivity, water based recreation, navigation, reservoir services, the productivity of steam power plants, and recreational fishing.

The beneficiaries of this benefit would include a broad cross-section of Californians, including downstream domestic, municipal, and agricultural water users who withdraw water from affected water bodies; freshwater and marine recreational and commercial fishermen; people who recreate in and nearby downstream water bodies; and farmers, municipal officials, and other property owners who maintain infrastructure downstream of the project area.

Passive-Use Value Associated with Increases in Salmonid Populations (Unquantifiable). To the extent that the project increases instream flows, it could enhance salmon habitat. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available information. Research suggests, however, that improvements in water quality and water quantity as provided by this project could improve the function of spawning and rearing habitat, potentially leading to increases in juvenile salmonid survival and increased salmonid populations (NMFS 2010, CDFGH 2004).

This benefit captures the passive-use value many Californians place on the continued existence of thriving salmon populations within the state. If data were available to quantify this benefit, we would employ a value of $2,000 per additional fish per year as a rough estimate of the passive-use benefit of increased salmon populations.[65]

[64] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

[65] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

The beneficiaries of this benefit would be Californians who value the survival of healthy salmon populations in California, but may never fish or directly interact with salmon.

Cultural Value Associated with Increases in Salmon Populations (Unquantifiable). To the extent that the project increases instream flows, it could enhance salmon habitat. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available information. Research suggests, however, that improvements in water quality and water quantity as provided by this project could improve the function of spawning and rearing habitat, potentially leading to increases in juvenile salmonid survival and increased salmonid populations (NMFS 2010, CDFGH 2004).

This benefit captures the cultural value many Native Americans place on the continued existence of thriving salmon populations within the state. Unlike many Californians who ascribe a monetary willingness to pay to protect salmon, even if they never intend to directly fish or watch them, many Native Americans recognize the importance of salmon outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we recognize the cultural significance that arises from the projects' improvements to salmonid populations and their habitat apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include Native American tribal members in the region and other Californians who believe the continued existence of salmonid populations and their habitat is essential to cultural and spiritual well-being.

Potential Increased Quality of Drinking Water (Unquantifiable). Water quality would improve for users through two mechanisms. First, as a result of the project, the City would use additional water from the Waterfall Gulch source and less from the Noyo source. The Waterfall Gulch water is of higher quality with less taste and odor issues. Second, the project would eliminate breaks and cracks in the pipeline, thereby reducing the amount of silt that enters the water collection system and improving water quality for users. Neither of these water quality effects is quantifiable in terms of water quality parameters.

D. Humboldt Bay WMA

362–Blue Lake Fieldbrook Pipeline Support Retrofit Project, Humboldt Bay Municipal Water District

1. Project Description and Background

Humboldt Bay Municipal Water District (HBMWD) supplies domestic water to the City of Blue Lake and the Fieldbrook Glendale Community Services District (FGCSD). The Blue Lake FGCSD pipeline currently crosses the Mad River via a 14-inch ductile iron pipeline attached to a North Coast Railroad Authority (NCRA) bridge. The proposed project would replace the current pipeline with an aerial

crossing for a new 14-inch diameter pipe, which would meet modern seismic codes and be located outside of the 100-year floodplain. Without the project, a moderately sized earthquake could pose a significant risk to the water supply by collapsing the Mad River Bridge, which is in substandard condition and near the end of its functional life. If the bridge collapses, HBMWD would need to make emergency repairs to the pipeline after the earthquake, which would disrupt water and wastewater service to the City of Blue Lake and the FGCSD. If a fire occurred while water service was disrupted after an earthquake, major damage to the community could result. With the project, communities and state and federal emergency-service agencies would avoid costs associated with repairing the pipeline after an earthquake, avoid costs associated with potable water service loss and wastewater service loss, and avoid fire damage caused after earthquake event when loss of water service occurs concurrently.

Under five different earthquake scenarios, the District would experience the following expected losses without the proposed project:

Table 362-1. Costs Associated with Five Different Earthquake Scenarios, Without the Proposed Project

Earthquake Scenario	I	II	III	IV	V
Annual Probability	0.9	0.6	0.11	0.1	0.9
Recurrence Interval	38	64	431	476	532
Repair Cost (dollars)	$46,500	$75,500	$458,000	$1,603,580	$1,603,580
Loss of Service (days)	2	4	14	60	120
Fire damage (dollars)	$0	$6,135,480	$6,135,480	$6,135,480	$6,135,480

Source: Humbolt Bay Municipal Water District

Under five different earthquake scenarios, the District would experience the following expected losses with the proposed project:

Table 362-2. Costs Associated with Five Different Earthquake Scenarios, With the Proposed Project

Earthquake Scenario	I	II	III	IV	V
Annual Probability	0.9	0.6	0.11	0.1	0.9
Recurrence Interval	38	64	431	476	532
Repair Cost (dollars)	$0	$0	$0	$0	$0
Loss of Service (days)	0	0	0	1	1
Fire damage (dollars)	$0	$0	$0	$0	$0

Source: Humbolt Bay Municipal Water District

2. Other Benefits

This project would create other benefits described below. Table 16-362 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Avoided Damage from Fire (Quantifiable). In all earthquake events, fire protection service would remain in effect. In earthquake scenarios IV and V the District will need to conduct inspection and anticipated minor repairs that will require that the pipeline be drained and inspected, but these repairs need not be completed immediately after the event, but within a couple of weeks. Using FEMA BCA software to derive annualized without-project damages, the annual costs without the project are $95,922 and the costs with the project are $0; the difference resulting from the project is a total annual benefit of $95,922.

Sufficiently large events have not occurred in the affected area in the last 100 years to estimate fire damage so we use surrogate data from two nearby towns that experienced two earthquake events. This analysis assumes, based on the surrogate data from these two events that fires will occur with certainty in the event of a sufficiently strong earthquake. The analysis furthermore assumes that, should the affected population lose water service concurrently with the earthquake, the area will lose 3.9 percent of the total structure value in the affected area (Humboldt Bay Municipal Water District, 2010).

As the severity of earthquake increases, the number of likely fires increases and thus the number of structures affected would increase. This project assumes, however, that for earthquake scenarios II through V, given a no-project scenario, the affected area would be without water for long enough that the fire fighting capacity is diminished to zero. With the proposed project, for earthquake scenarios II through V, the duration of any outages will be short enough that fire fighting reserves will be available and service will be reinstated before those reserves are depleted if there is an interruption in service at all. Since data were not available to determine the increase in property loss under stronger earthquake events, a conservative assumption of the same level of loss was made.

E. Eel River WMA

405–Sustainable Forests, Clean Water and Carbon Sequestration Demonstration Project, Redwood Forest Foundation, Inc.

1. Project Description and Background

The Sustainable Forests, Clean Water and Carbon Sequestration Demonstration Project would create biochar with biomass collected from 37 acres of dense forestland over a two year period. Without the project, 37 acres of dense forestland would not be thinned, reducing surface flows, and increasing the likelihood of a catastrophic fire event in the future along with other negative impacts to the watershed that accompany fire events, such as increased sedimentation, biodiversity loss, and increased susceptibility to invasion by exotic species. With the project, 37 additional acres of dense forestland would be thinned, reducing the likelihood of a catastrophic fire event, improving hydrologic function and aquatic and riparian habitat, and increasing carbon sequestration and soil health through the production and use of biochar. The project would also create access to an acorn harvesting orchard for use by Native American communities who derive cultural value from access to acorn orchards.

2. Water-Quality Benefits

This project would create water-quality benefits described below. Table 16-405 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Passive-Use Value Associated with Increases in Salmonid Populations (Unquantifiable). By increasing instream flow and decreasing the likelihood of a catastrophic fire along with the likelihood of the negative impacts on water quality associated with catastrophic fires, the project would enhance salmonid habitat in the watershed. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available information. Research suggests, however, that improvements in water quality and water quantity as provided by this project would improve the function of spawning and rearing habitat, potentially leading to increases in juvenile salmonid survival and increased salmonid populations (NMFS 2010, CDFGH 2004).

This benefit captures the passive-use value many Californians place on the continued existence of thriving salmon populations within the state. If data were available to quantify this, we would employ a value of $2,000 per additional fish per year as a rough estimate of the passive-use benefit of increased salmon populations.[66]

The beneficiaries of this benefit would be Californians who value the survival of healthy salmon populations in California, but may never fish or directly interact with salmon.

[66] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

Cultural Value Associated with Increases in Salmon Populations (Unquantifiable). By increasing instream flow and decreasing the likelihood of a catastrophic fire along with the likelihood of the negative impacts on water quality associated with catastrophic fires, the project would enhance salmonid habitat in the watershed. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available information. Research suggests, however, that improvements in water quality and water quantity as provided by this project would improve the function of spawning and rearing habitat, potentially leading to increases in juvenile salmonid survival and increased salmonid populations (NMFS 2010, CDFGH 2004).

This benefit captures the cultural value many Native Americans place on the continued existence of thriving salmon populations within the state. Unlike many Californians who ascribe a monetary willingness to pay to protect salmon, even if they never intend to directly fish or watch them, many Native Americans recognize the importance of salmon outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we recognize the cultural significance that arises from the projects' improvements to salmonid populations and their habitat apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include Native American tribal members in the region and other Californians and beyond who believe the continued existence of salmonid populations and their habitat is essential to cultural and spiritual well-being.

3. Other Benefits

This project would create other benefits described below. Table 16-405 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Value of Decrease in Likelihood of Catastrophic Fire Event (Unquantifiable). Research suggests that the thinning of dense forestland, such as that accomplished by this project, decreases the likelihood of a catastrophic fire event (Bonnicksen, 2009). Direct, quantitative linkages between the project and decreased likelihood of a catastrophic fire event are impossible to identify, given the available information. Catastrophic fires are associated with several negative impacts on riparian and aquatic habitats and the wildlife therein. Chief among these negative impacts is the increase in sedimentation. Research suggests that sedimentation rates could be as high as 17.2 tons/acre/year for four years after a catastrophic fire event (Dahlgren et al., 2001). Furthermore, catastrophic fire decreases biological productivity, , accelerates insect and disease outbreaks, and changes historical migration routes for migratory birds, terrestrial mammals, and aquatic wildlife (Bartuska and Eubanks, 2004). Additionally, catastrophic fires may permanently change native habitats (type conversion) and cause large amounts of GHG emissions – contributing to climate change and negatively impacting public health. Insofar as the project decreases the likelihood of catastrophic fires, it could decrease fire fighting costs which, in 2008 were $1,016 per acre in Mendocino County (California Department of Forestry and Fire Protection, 2010).

Beneficiaries of these benefits would include federal and state taxpayers insofar as it decreases time and resources spent on fighting forest fires and on future projects aimed at restoring water quality, biodiversity, and habitat in areas where forest fires have occurred, and local residents insofar as it decreases damages stemming from forest fires.

Avoided Cost of Carbon Dioxide Emissions (Quantifiable). Left alone, biomass decays over time, releasing carbon dioxide into the atmosphere. The project would convert existing biomass into biochar, a stable carbon-based solid that permanently locks carbon into a solid-state (so long as the biochar is not burned for fuel). The project would generate 187.5 tons of biochar per year for two years, resulting in the sequestration of 1,125 tons of carbon dioxide over the duration of the project.

By sequestering carbon dioxide that would otherwise be released into the atmosphere, the project would reduce or delay potentially harmful costs associated with climate change. We use a middle value from the literature to estimate the social cost of carbon dioxide at $32.49/ton of carbon dioxide in 2009. We assume this value increases, in real terms, by 2.5 percent per year.[67]

Insofar as the carbon sequestration accomplished by this project reduces the potential negative impacts of climate change, beneficiaries of this benefit would include all residents in California, indeed the entire global population.

Improved Soil Quality (Unquantifiable). The project would generate and sell 187.5 tons of biochar per year for two years. This biochar would improve soil quality where used by retaining nutrients, and supporting vegetative growth (Lehmann et al., 2006). Data are insufficient to know where the biochar would be used and where its benefits would be realized. The value of improved soil quality provided by biochar is similarly difficult to estimate. Project sponsors estimate they would sell the biochar for a price of $2,000 per ton. Since biochar is typically purchased for its capacity to improve soil quality, the expected sales price of the biochar, $2,000 per ton, serves as a lower bound for its value.

Beneficiaries of this benefit include individuals, organizations, and firms using the biochar insofar as it increases vegetative productivity.

Cultural Value Derived from Access to Acorn Harvesting Orchard (Unquantifiable). By thinning specific patches of forestland, the project would open up access to interested individuals (particularly Native American groups) in the area to harvest acorns. Historically, acorns have been important to Native American communities in Northern California who consider them a staple food crop (Anderson and Moratto 1996). Prior to commercial use of the forestland within the project area by the timber industry, Native American populations used the area for ceremonial and cultural practices including acorn harvesting. By providing access to the forest, the project allows these

[67] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

cultural practices and traditions to continue in the future, which is valuable to the Native American communities that participate in them.

Unlike many Californians who ascribe a monetary willingness to pay to protect salmon, even if they never intend to directly fish or watch them, many Native Americans recognize the importance of natural resources the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we recognize the cultural significance that arises from the project's enhanced access for acorn-harvesting apart from other measures of economic benefits.

The beneficiaries of this benefit would include Native American tribal members in the region and other Californians and beyond who believe the continued existence of native, culturally-important plant and animal species is essential to cultural and spiritual well-being.

F. Trinity River WMA

357–Highway 96 Stormceptor, Willow Creek Community Services District

1. Project Description and Background

The Highway 96 Stormceptor project would install new stormwater infrastructure, including an interceptor pipe to divert storm drainage from Highway 96 and the Willow Creek commercial business district, and a detention pond for contaminant settling prior to eventual discharge into Willow Creek. Without the project, the Willow Creek Community Services District's domestic water intake would be at risk from premature failure from sediment and other contaminants carried with stormwater flows, which are deposited upstream of the existing domestic water intake in Willow Creek. It would also be at risk from major contamination and system shutdown in the event of an emergency spill or accident that discharges toxic pollutants into Willow Creek. Either premature failure or emergency discharge could result in the temporary shutdown of the water system and service disruption to customers. The commercial business district of Willow Creek would be more vulnerable to property damage as a result of a flood event. With the project, the new stormwater infrastructure would protect the District's domestic water treatment system from emergency discharges, and would allow the filtration equipment to function for its expected lifespan. The new stormwater system would also lower the probability of flooding, and the cost of flood damage within the Willow Creek commercial business district.

2. Water-Quality Benefits

This project would create water-quality benefits described below. Table 16-357 presents the value of the benefits, by category, in the years they would occur, and calculates their total present value.

Avoided Costs of Sediment Deposition (Unquantifiable). The proposed project would remove contaminants and sediment from stormwater flowing out of the commercial business district and off of Highway 96 before they reach Willow Creek and flow downstream into the Trinity River, which is

303(d) listed for sediment. Data are not available to quantify the amount of sediment reduction the project would generate. If these data were available, we would calculate the value of the avoided costs of sediment deposition by multiplying $11.28 per ton, which represents the costs associated with sediment deposition within the North Coast region.[68]

The beneficiaries of this benefit would include a broad cross-section of Californians, including downstream domestic, municipal, and agricultural water users who withdraw water from affected water bodies; freshwater and marine recreational and commercial fishermen; people who recreate in and nearby downstream water bodies; and farmers, municipal officials, and other property owners who maintain infrastructure downstream of the project area.

Avoided Replacement Costs (Quantifiable). The current domestic water system is under threat from contaminants from two sources. First, stormwater runoff from the surrounding commercial district and nearby highway 96 deposits contaminants into Willow Creek just upstream from the intake for the domestic water system. These contaminants slowly erode the effectiveness of the filtration and other components of the domestic water system over time and significantly shorten their usable expected life. Second, should a catastrophic event occur in the commercial district or on the highway, it would release an overwhelming level of contaminants into the storm system and necessitate the replacement of the system earlier than expected.

The current water system was built in 2007. The total cost of construction was $2.2 million, of which $1.3 million was the cost of the components ($1.35 million in 2009 dollars). The current system's expected life, under perfect conditions, is twenty-five years, which means the district would need to replace the system in 2032.

Given the current, without-project conditions in Willow Creek, the system's life would be degraded, at a depreciation rate of 5 percent per year. As a result, without the project the system would require replacement in 2022 (assuming an additional 5-percent depreciation rate on a 25-year lifespan). The benefit of the project is the cost savings associated with replacing the system in 2028 (assuming a 25-year lifespan, with an additional 5-percent depreciation occurring between 2007 and 2012) at $1.35 million (2009 Present Value of $446,850) rather than in 2022 at $1.35 million (2009 Present Value of $596,700). The value of this benefit is difference of these two costs in present value or $149,850. The probability that an emergency toxic discharge would occur that would necessitate replacement of the filtration system earlier than 2022 is very small, thus we do not quantify the potential costs associated with this scenario.

The beneficiaries of this benefit would include operators and ratepayers of the Willow Creek Community Services District.

[68] The total costs include costs associated with maintaining irrigation ditches and canals, marine recreational and commercial fishing, freshwater fisheries, flood damage, road drainage ditches, municipal and industrial water use, municipal water treatment, power production, soil productivity, water-based recreation, and navigation. See regional-level benefits section for a description of the methodology and source used to derive this estimate.

Passive-Use Value Associated with Increases in Salmonid Populations (Unquantifiable). Removing silt and sediment from Willow Creek would help promote the survival of fish populations in the Trinity River, including coho (*Oncorhynchus kisutch*) and chinook salmon (*O. tshawytscha*), green sturgeon (*Acipenser medirostris*), and steelhead (*O. mykiss*), which are common in this water body. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available data. Research suggests, however, that reducing sediment loading in salmon-bearing streams may lead to increases in juvenile salmonid survival and increased salmonid populations (NMFS 2010, CDFGH 2004).

This benefit captures the passive-use value many Californians place on the continued existence of thriving salmon populations within the state. If data were available to quantify this, we would employ a value of $2,000 per additional fish per year as a rough estimate of the passive-use benefit of increased salmon populations.[69]

The beneficiaries of this benefit would be Californians who value the survival of healthy salmon populations in California, but may never fish or directly interact with salmon.

Cultural Value Associated with Increases in Salmon Populations (Unquantifiable). Removing silt and sediment from Willow Creek would help promote the survival of fish populations in the Trinity River, including Coho and Chinook salmon, green sturgeon, and steelhead, which are common in this water body. Direct, quantitative linkages between the project and salmon-related benefits, such as an increase in salmonid populations, are impossible to identify, given the available data. Research suggests, however, that reducing sediment loading in salmon-bearing streams may lead to increases in juvenile salmonid survival and increased salmonid populations (NMFS 2010, CDFGH 2004).

This benefit captures the cultural value many Native Americans place on the continued existence of thriving salmon populations within the state. Unlike many Californians who ascribe a monetary willingness to pay to protect salmon, even if they never intend to directly fish or watch them, many Native Americans recognize the importance of salmon outside the cultural framework and economic terms western society often imposes (Malloy 1992). For this reason, we recognize the cultural significance that arises from the projects' improvements to salmonid populations and their habitat apart from the quantified passive-use value or other measures of economic benefits.

The beneficiaries of this benefit would include Native American tribal members in the region and other Californians who believe the continued existence of salmonid populations and their habitat is essential to cultural and spiritual well-being.

[69] See regional-level benefits section for a description of the methodology and source used to derive this estimate.

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VI. Project-Level Water-Quality and Other Expected Benefits (Table 16)

Tables 16-402 through 16-357 present the project-level water-quality and other expected benefits, as described above in Section IV.

Table 16 - Water Quality and Other Expected Benefits

(All benefits should be in 2009 dollars)

Project: 402--Ackerman Creek Habitat Restoration, Pinoleville Pomo Nation

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit $ Value [1]	(h) Annual $ Value (f) x (g) [1]	(i) Discount Factor [1]	(j) Discounted Benefits (h) x (i) [1]
2009	No benefit								
2010	No benefit								
2011	No benefit								
2012	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.840	$403
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.840	$2,100
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	5.66	5.66	$34.98	$198	0.840	$166
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2013	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.792	$380
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	5.66	5.66	$35.86	$203	0.792	$161
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2014	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.747	$359
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.747	$1,868
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	5.66	5.66	$36.76	$208	0.747	$156
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2015	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.705	$338
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	5.66	5.66	$37.67	$213	0.705	$150
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2016	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.665	$319
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.665	$1,663
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	5.66	5.66	$38.62	$219	0.665	$145
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2017	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.627	$301
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	3.80	3.80	$39.58	$151	0.627	$94

	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2018	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.592	$284
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.592	$1,480
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	3.80	3.80	$40.57	$154	0.592	$91
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2019	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.558	$268
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	3.80	3.80	$41.59	$158	0.558	$88
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2020	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.527	$253
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.527	$1,318
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	3.80	3.80	$42.63	$162	0.527	$85
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2021	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.497	$239
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	3.80	3.80	$43.69	$166	0.497	$83
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2022	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.469	$225
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.469	$1,173
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	3.80	3.80	$44.78	$170	0.469	$80
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2023	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.442	$212
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	3.80	3.80	$45.90	$175	0.442	$77
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							

	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2024	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.417	$200
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.417	$1,043
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	3.80	3.80	$47.05	$179	0.417	$75
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2025	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.394	$189
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	3.80	3.80	$48.23	$183	0.394	$72
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2026	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.371	$178
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.371	$928
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	3.80	3.80	$49.43	$188	0.371	$70
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2027	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.350	$168
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	4.37	4.37	$50.67	$221	0.350	$77
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2028	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.331	$159
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.331	$828
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	4.37	4.37	$51.93	$227	0.331	$75
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2029	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.312	$150
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	4.37	4.37	$53.23	$233	0.312	$73
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							

2030	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.294	$141
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.294	$735
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	4.37	4.37	$54.56	$238	0.294	$70
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2031	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.278	$133
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	4.37	4.37	$55.93	$244	0.278	$68
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2032	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.262	$126
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.262	$655
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	4.37	4.37	$57.33	$250	0.262	$66
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2033	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.247	$119
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	4.37	4.37	$58.76	$257	0.247	$63
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2034	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.233	$112
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.233	$583
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	4.37	4.37	$60.23	$263	0.233	$61
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2035	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.220	$106
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	4.37	4.37	$61.73	$270	0.220	$59
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2036	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.207	$99
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.207	$518
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	4.37	4.37	$63.28	$276	0.207	$57

	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2037	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.196	$94
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	6.39	6.39	$64.86	$415	0.196	$81
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2038	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.185	$89
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.185	$463
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	6.39	6.39	$66.48	$425	0.185	$79
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2039	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.174	$84
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	6.39	6.39	$68.14	$436	0.174	$76
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2040	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.164	$79
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.164	$410
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	6.39	6.39	$69.85	$446	0.164	$73
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2041	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.155	$74
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	6.39	6.39	$71.59	$458	0.155	$71
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2042	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.146	$70
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.146	$365
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	6.39	6.39	$73.38	$469	0.146	$68
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							

	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2043	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.138	$66
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	6.39	6.39	$75.22	$481	0.138	$66
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2044	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.130	$62
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.130	$325
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	6.39	6.39	$77.10	$493	0.130	$64
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2045	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.123	$59
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	6.39	6.39	$79.02	$505	0.123	$62
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2046	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.116	$56
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.116	$290
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	6.39	6.39	$81.00	$518	0.116	$60
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2047	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.109	$52
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	8.39	8.39	$83.03	$696	0.109	$76
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2048	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.103	$49
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.103	$258
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	8.39	8.39	$85.10	$714	0.103	$74
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2049	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.097	$47

	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	8.39	8.39	$87.23	$732	0.097	$71
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2050	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.092	$44
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.092	$230
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	8.39	8.39	$89.41	$750	0.092	$69
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2051	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.087	$42
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	8.39	8.39	$91.64	$769	0.087	$67
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2052	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.082	$39
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.082	$205
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	8.39	8.39	$93.94	$788	0.082	$65
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2053	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.077	$37
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	8.39	8.39	$96.28	$808	0.077	$62
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2054	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.073	$35
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.073	$183
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	8.39	8.39	$98.69	$828	0.073	$60
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2055	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.069	$33
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	8.39	8.39	$101.16	$848	0.069	$59
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							

	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2056	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.065	$31
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.065	$163
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	8.39	8.39	$103.69	$870	0.065	$57
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2057	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.061	$29
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	9.03	9.03	$106.28	$960	0.061	$59
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
2058	Passive-use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	4	4	$120.00	$480	0.058	$28
	Avoided cost of sediment reduction projects	Biannual sediment reduction projects	0	1	1	$2,500	$2,500	0.058	$145
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	9.03	9.03	$108.94	$984	0.058	$57
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value assocaited with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value of educational outreach to tribal youth	Unquantifiable (see narrative description)							
Project Life								…	
								Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries	**$28,323**
Comments: See narrative description in Attachment 8 for a description of these benefits.									

(1) Complete these columns if dollar value is being claimed for the benefit.

Table 16 - Water Quality and Other Expected Benefits

(All benefits should be in 2009 dollars)

Project: 345--Bodega Bay Water Resources Management Project, Gold Ridge Resource Conservaiton District

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit $ Value (1)	(h) Annual $ Value (f) x (g) (1)	(i) Discount Factor (1)	(j) Discounted Benefits (h) x (i) (1)
2009	No benefits				0		$0	1.000	$0
2010	No benefits				0		$0	0.943	$0
2011	No benefits				0		$0	0.890	$0
2012	No benefits				0		$0	0.840	$0
2013	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.792	$1,825
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	27.19	27.19	$32.49	$883	0.792	$700
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2014	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	586	586	$11.28	$6,610	0.747	$4,938
	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.747	$1,721
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	27.19	27.19	$33.30	$905	0.747	$676
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (see narrative description)							
2015	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	586	586	$11.28	$6,610	0.705	$4,660
	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.705	$1,624
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	27.19	27.19	$34.13	$928	0.705	$654
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (see narrative description)							
2016	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	586	586	$11.28	$6,610	0.665	$4,396
	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.665	$1,532
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	27.19	27.19	$34.99	$951	0.665	$633
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (see narrative description)							
2017	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	586	586	$11.28	$6,610	0.627	$4,145
	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.627	$1,445
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	27.19	27.19	$35.86	$975		$0
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (see narrative description)							
2018	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	586	586	$11.28	$6,610	0.592	$3,913
	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.592	$1,364
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	18.25	18.25	$36.76	$671	0.592	$397
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (see narrative description)							
2019	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	586	586	$11.28	$6,610	0.558	$3,688
	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.558	$1,286
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	18.25	18.25	$37.68	$688	0.558	$384

	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (see narrative description)							
2020	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	586	586	$11.28	$6,610	0.527	$3,484
	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.527	$1,214
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	18.25	18.25	$38.62	$705	0.527	$371
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (see narrative description)							
2021	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	586	586	$11.28	$6,610	0.497	$3,285
	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.497	$1,145
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	18.25	18.25	$39.59	$722	0.497	$359
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (see narrative description)							
2022	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	586	586	$11.28	$6,610	0.467	$3,087
	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.467	$1,076
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	18.25	18.25	$40.58	$741	0.467	$346
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (see narrative description)							
2023	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	586	586	$11.28	$6,610	0.442	$2,922
	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.442	$1,018
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	18.25	18.25	$41.59	$759	0.442	$335
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (see narrative description)							
2024	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.417	$961
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	18.25	18.25	$42.63	$778	0.417	$324
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2025	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.394	$908
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	18.25	18.25	$43.70	$797	0.394	$314
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2026	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.371	$855
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	18.25	18.25	$44.79	$817	0.371	$303
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2027	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.350	$806
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	18.25	18.25	$45.91	$838	0.350	$293
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							

	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2028	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.331	$763
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	20.97	20.97	$47.06	$987	0.331	$327
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2029	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.312	$719
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	20.97	20.97	$48.23	$1,011	0.312	$316
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2030	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.294	$677
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	20.97	20.97	$49.44	$1,037	0.294	$305
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2031	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.278	$641
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	20.97	20.97	$50.67	$1,063	0.278	$295
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2032	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.262	$604
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	20.97	20.97	$51.94	$1,089	0.262	$285
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2033	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.247	$569
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	20.97	20.97	$53.24	$1,116	0.247	$276
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2034	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.233	$537
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	20.97	20.97	$54.57	$1,144	0.233	$267
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2035	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.220	$507
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	20.97	20.97	$55.93	$1,173	0.220	$258
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2036	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.207	$477
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							

	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	20.97	20.97	$57.33	$1,202	0.207	$249
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2037	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.196	$452
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	20.97	20.97	$58.77	$1,232	0.196	$242
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2038	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.185	$426
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	30.68	30.68	$60.23	$1,848	0.185	$342
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2039	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.174	$401
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	30.68	30.68	$61.74	$1,894	0.174	$330
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2040	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.164	$378
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	30.68	30.68	$63.28	$1,942	0.164	$318
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2041	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.155	$357
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	30.68	30.68	$64.87	$1,990	0.155	$308
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2042	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.146	$336
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	30.68	30.68	$66.49	$2,040	0.146	$298
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2043	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.138	$318
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	30.68	30.68	$68.15	$2,091	0.138	$289
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2044	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.130	$300
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	30.68	30.68	$69.85	$2,143	0.130	$279
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							

	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2045	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.123	$283
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	30.68	30.68	$71.60	$2,197	0.123	$270
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2046	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.116	$267
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	30.68	30.68	$73.39	$2,252	0.116	$261
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2047	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.109	$251
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	30.68	30.68	$75.22	$2,308	0.109	$252
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2048	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.103	$237
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	40.26	40.26	$77.11	$3,104	0.103	$320
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2049	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.097	$223
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	40.26	40.26	$79.03	$3,182	0.097	$309
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2050	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.092	$212
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	40.26	40.26	$81.01	$3,261	0.092	$300
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2051	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.087	$200
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	40.26	40.26	$83.03	$3,343	0.087	$291
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2052	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.082	$189
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	40.26	40.26	$85.11	$3,427	0.082	$281
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2053	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.077	$177
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							

	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	40.26	40.26	$87.24	$3,512	0.077	$270
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2054	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.073	$168
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	40.26	40.26	$89.42	$3,600	0.073	$263
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2055	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.069	$159
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	40.26	40.26	$91.65	$3,690	0.069	$255
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2056	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.065	$150
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	40.26	40.26	$93.95	$3,782	0.065	$246
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2057	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.061	$141
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	40.26	40.26	$96.29	$3,877	0.061	$236
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2058	Passive use value associated with increases in forest biodiversity	Acre of riparian forest resotration	0	19.20	19.2	$120	$2,304	0.058	$134
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	43.37	43.37	$98.70	$4,281	0.058	$248
	Passive-use values associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
								Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries	**$83,424**
Comments: See narrative description in Attachment 8 for a description of these benefits.									

(1) Complete these columns if dollar value is being claimed for the benefit.

Table 16 - Water Quality and Other Expected Benefits

(All benefits should be in 2009 dollars)

Project: 292--Lower Russian River Water Quality Improvement Project, Sotoyome Resource Conservation District

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit $ Value (1)	(h) Annual $ Value (f) x (g) (1)	(i) Discount Factor (1)	(j) Discounted Benefits (h) x (i) (1)
2009	No benefits				0		$0	1.000	$0
2010	No benefits				0		$0	0.943	$0
2011	No benefits				0		$0	0.890	$0
2012	No benefits				0		$0	0.840	$0
2013	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	1,243	1,243	$11.28	$14,021	0.792	$11,105
	Passive-use value associated with salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (See Narrative Text)							
	Increased quality of drinking water	Unquantifiable (See Narrative Text)							
2014	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	1,243	1,243	$11.28	$14,021	0.747	$10,474
	Passive-use value associated with salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (See Narrative Text)							
	Increased quality of drinking water	Unquantifiable (See Narrative Text)							
2015	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	1,243	1,243	$11.28	$14,021	0.705	$9,885
	Passive-use value associated with salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (See Narrative Text)							
	Increased quality of drinking water	Unquantifiable (See Narrative Text)							
2016	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	1,243	1,243	$11.28	$14,021	0.665	$9,324
	Passive-use value associated with salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (See Narrative Text)							
	Increased quality of drinking water	Unquantifiable (See Narrative Text)							
2017	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	1,243	1,243	$11.28	$14,021	0.627	$8,791
	Passive-use value associated with salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (See Narrative Text)							
	Increased quality of drinking water	Unquantifiable (See Narrative Text)							
2018	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	1,243	1,243	$11.28	$14,021	0.592	$8,300
	Passive-use value associated with salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							

	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (See Narrative Text)							
	Increased quality of drinking water	Unquantifiable (See Narrative Text)							
2019	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	1,243	1,243	$11.28	$14,021	0.558	$7,824
	Passive-use value associated with salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (See Narrative Text)							
	Increased quality of drinking water	Unquantifiable (See Narrative Text)							
2020	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	1,243	1,243	$11.28	$14,021	0.527	$7,389
	Passive-use value associated with salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (See Narrative Text)							
	Increased quality of drinking water	Unquantifiable (See Narrative Text)							
2021	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	1,243	1,243	$11.28	$14,021	0.497	$6,968
	Passive-use value associated with salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (See Narrative Text)							
	Increased quality of drinking water	Unquantifiable (See Narrative Text)							
2022	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	1,243	1,243	$11.28	$14,021	0.469	$6,576
	Passive-use value associated with salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (See Narrative Text)							
	Increased quality of drinking water	Unquantifiable (See Narrative Text)							
2023	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2024	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2025	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							

	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2026	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2027	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2028	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2029	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2030	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2031	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2032	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							

	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2033	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2034	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2035	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2036	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2037	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2038	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2039	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							

	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2040	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2041	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2042	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2043	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2044	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2045	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2046	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							

	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2047	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2048	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2049	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2050	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2051	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2052	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2053	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							

	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2054	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2055	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2056	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2057	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
2058	Passive-use value associated with salmon populations	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Improved reliability of road access	Unquantifiable (See Narrative Text)							
	Improved access for emergency response vehicles	Unquantifiable (See Narrative Text)							
	Potential increase of recreation opportunities from reduced pathogenic loading	Unquantifiable (see narrative description)							
	Potential increased quality of drinking water from reduced pathogenic loading	Unquantifiable (see narrative description)							
								Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries	**$86,636**

Comments: See narrative description in Attachment 8 for a description of these benefits.

(1) Complete these columns if dollar value is being claimed for the benefit.

Table 16 - Water Quality and Other Expected Benefits

(All benefits should be in 2009 dollars)

Project: 364--Mendocino Jumpstart Integrated Water Plan, Mendocino County Water Agency

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit $ Value (1)	(h) Annual $ Value (f) x (g) (1)	(i) Discount Factor (1)	(j) Discounted Benefits (h) x (i) (1)
2009	No benefit							1.000	$0
2010	No benefit							0.943	$0
2011	No benefit							0.890	$0
2012	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.840	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.840	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.840	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.840	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.840	$50
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.840	$1,176
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.840	$0
2013	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.792	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.792	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.792	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.792	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.792	$48
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.792	$1,109
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.792	$0
2014	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.747	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.747	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.747	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.747	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.747	$45
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.747	$1,046
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.747	$0
2015	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.705	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.705	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.705	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.705	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.705	$42
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.705	$987
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.705	$0
2016	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.665	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.665	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.665	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.665	$0

	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.665	$40
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.665	$931
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.665	$0
2017	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.627	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.627	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.627	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.627	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.627	$38
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.627	$878
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.627	$0
2018	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.592	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.592	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.592	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.592	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.592	$36
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.592	$829
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.592	$0
2019	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.558	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.558	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.558	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.558	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.558	$33
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.558	$781
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.558	$0
2020	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.527	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.527	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.527	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.527	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.527	$32
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.527	$738
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.527	$0
2021	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.497	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.497	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.497	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.497	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.497	$30
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.497	$696
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.497	$0

2022	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.469	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.469	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.469	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.469	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.469	$28
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.469	$657
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.469	$0
2023	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.442	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.442	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.442	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.442	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.442	$27
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.442	$619
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.442	$0
2024	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.417	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.417	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.417	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.417	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.417	$25
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.417	$584
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.417	$0
2025	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.394	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.394	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.394	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.394	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.394	$24
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.394	$552
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.394	$0
2026	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.371	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.371	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.371	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.371	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.371	$22
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.371	$519
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.371	$0
2027	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.350	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.350	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.350	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.350	$0

	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.350	$21
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.350	$490
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.350	$0
2028	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.331	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.331	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.331	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.331	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.331	$20
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.331	$463
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.331	$0
2029	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.312	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.312	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.312	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.312	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.312	$19
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.312	$437
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.312	$0
2030	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.294	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.294	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.294	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.294	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.294	$18
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.294	$412
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.294	$0
2031	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.278	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.278	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.278	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.278	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.278	$17
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.278	$389
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.278	$0
2032	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.262	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.262	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.262	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.262	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.262	$16
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.262	$367
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.262	$0

2033	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.247	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.247	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.247	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.247	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.247	$15
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.247	$346
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.247	$0
2034	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.233	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.233	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.233	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.233	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.233	$14
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.233	$326
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.233	$0
2035	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.220	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.220	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.220	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.220	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.220	$13
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.220	$308
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.220	$0
2036	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.207	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.207	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.207	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.207	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.207	$12
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.207	$290
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.207	$0
2037	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.196	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.196	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.196	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.196	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.196	$12
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.196	$274
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.196	$0
2038	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.185	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.185	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.185	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.185	$0

	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.185	$11
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.185	$259
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.185	$0
2039	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.174	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.174	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.174	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.174	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.174	$10
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.174	$244
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.174	$0
2040	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.164	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.164	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.164	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.164	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.164	$10
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.164	$230
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.164	$0
2041	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.155	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.155	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.155	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.155	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.155	$9
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.155	$217
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.155	$0
2042	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.146	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.146	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.146	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.146	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.146	$9
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.146	$204
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.146	$0
2043	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.138	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.138	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.138	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.138	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.138	$8
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.138	$193
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.138	$0

2044	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.130	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.130	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.130	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.130	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.130	$8
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.130	$182
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.130	$0
2045	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.123	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.123	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.123	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.123	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.123	$7
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.123	$172
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.123	$0
2046	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.116	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.116	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.116	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.116	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.116	$7
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.116	$162
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.116	$0
2047	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.109	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.109	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.109	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.109	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.109	$7
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.109	$153
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.109	$0
2048	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.103	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.103	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.103	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.103	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.103	$6
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.103	$144
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.103	$0
2049	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.097	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.097	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.097	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.097	$0

	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.097	$6
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.097	$136
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.097	$0
2050	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.092	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.092	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.092	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.092	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.092	$6
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.092	$129
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.092	$0
2051	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.087	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.087	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.087	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.087	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.087	$5
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.087	$122
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.087	$0
2052	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.082	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.082	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.082	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.082	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.082	$5
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.082	$115
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.082	$0
2053	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.077	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.077	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.077	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.077	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.077	$5
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.077	$108
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.077	$0
2054	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.069	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.069	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.069	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.069	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.069	$4
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.069	$97
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.069	$0

2055	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.065	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.065	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.065	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.065	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.065	$4
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.065	$91
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.065	$0
2056	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.061	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.061	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.061	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.061	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.061	$4
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.061	$85
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.061	$0
2057	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.058	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.058	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.058	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.058	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.058	$3
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.058	$81
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.058	$0
2058	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)						0.054	$0
	Avoided water-treatment and compliance costs	Unquantifiable (See Narrative Text)						0.054	$0
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)						0.054	$0
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)						0.054	$0
	Passive use value associated with increases in vernal pool biodiversity	Acre of additional vernal pool biodiversity	0	0.5	0.5	$120	$60	0.054	$3
	Cultural value associted with increases in vernal pool diversity	Unquantifiable (See Narrative Text)							
	Increased quantity of recreation	Number of users	0	50	50	$28	$1,400	0.054	$76
	Enhanced human and social capital	Unquantifiable (See Narrative Text)						0.054	$0
Project Life									
							Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries		**$20,233**
Comments: See narrative description in Attachment 8 for a description of these benefits.									

(1) Complete these columns if dollar value is being claimed for the benefit.

Table 16 - Water Quality and Other Expected Benefits

(All benefits should be in 2009 dollars)

Project: 374-6--Nissa-kah Creek Fish Passage Removal, Hopland Band of Pomo Indians

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit $ Value [1]	(h) Annual $ Value (f) x (g) [1]	(i) Discount Factor [1]	(j) Discounted Benefits (h) x (i) [1]
2009	No benefit				0			1.000	
2010	No benefit				0			0.943	
2011	No benefit				0			0.890	
2012	No benefit				0			0.840	
2013	No benefit				0			0.792	
2014	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.747	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2015	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.705	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2016	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.655	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2017	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.627	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2018	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.592	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2019	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.558	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2020	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.527	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2021	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.497	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2022	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.469	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2023	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.442	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2024	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.417	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2025	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.394	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2026	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.371	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2027	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.350	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2028	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.331	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2029	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.312	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2030	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.294	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2031	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.278	

	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2032	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.262	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2033	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.247	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2034	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.233	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2035	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.220	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2036	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.207	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2037	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.196	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2038	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.185	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2039	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.174	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2040	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.164	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2041	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.155	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2042	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.146	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2043	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.138	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2044	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.130	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2045	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.123	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2046	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.116	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2047	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.109	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2048	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.103	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2049	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.097	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2050	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.092	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2051	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.087	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2052	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.082	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2053	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.077	

	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2054	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.073	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2055	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.069	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2056	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.065	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2057	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.061	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2058	Passive use values associated with increased spawning habitat	Mile of additional spawning habitat	0	2	2			0.058	
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
Project Life									
								Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries	
Comments: See narrative description in Attachment 8 for a description of these benefits.									

(1) Complete these columns if dollar value is being claimed for the benefit.

Table 16 - Water Quality and Other Expected Benefits

(All benefits should be in 2009 dollars)

Project: 393–Russian River Arundo Removal and Riparian Enhancement, Sotoyome Resource Conservation District

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit $ Value [1]	(h) Annual $ Value (f) x (g) [1]	(i) Discount Factor [1]	(j) Discounted Benefits (h) x (i) [1]
2009	No benefit								
2010	No benefit								
2011	No benefit								
2012	No benefit								
2013	No benefit								
2014	No benefit								
2015	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.705	$16,920
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	283.18	283.18	$37.67	$10,669	0.705	$7,521
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2016	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.665	$15,960
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	283.18	283.18	$38.62	$10,935	0.665	$7,272
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2017	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.627	$15,048
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	283.18	283.18	$39.58	$11,209	0.627	$7,028
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2018	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.592	$14,208
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	283.18	283.18	$40.57	$11,489	0.592	$6,801
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2019	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.558	$13,392
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	283.18	283.18	$41.59	$11,776	0.558	$6,571
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2020	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.527	$12,648
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	190.14	190.14	$42.63	$8,105	0.527	$4,271
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2021	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.497	$11,928
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	190.14	190.14	$43.69	$8,307	0.497	$4,129
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							

	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2022	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.469	$11,256
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	190.14	190.14	$44.78	$8,515	0.469	$3,994
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2023	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.442	$10,608
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	190.14	190.14	$45.90	$8,728	0.442	$3,858
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2024	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.417	$10,008
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	190.14	190.14	$47.05	$8,946	0.417	$3,731
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2025	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.394	$9,456
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	190.14	190.14	$48.23	$9,170	0.394	$3,613
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2026	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.371	$8,904
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	190.14	190.14	$49.43	$9,399	0.371	$3,487
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2027	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.350	$8,400
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	190.14	190.14	$50.67	$9,634	0.350	$3,372
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2028	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.331	$7,944
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	190.14	190.14	$51.93	$9,875	0.331	$3,269
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2029	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.312	$7,488
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	190.14	190.14	$53.23	$10,122	0.312	$3,158
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							

	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2030	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.294	$7,056
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	218.46	218.46	$54.56	$11,920	0.294	$3,504
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2031	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.278	$6,672
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	218.46	218.46	$55.93	$12,218	0.278	$3,397
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2032	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.262	$6,288
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	218.46	218.46	$57.33	$12,523	0.262	$3,281
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2033	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.247	$5,928
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	218.46	218.46	$58.76	$12,837	0.247	$3,171
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2034	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.233	$5,592
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	218.46	218.46	$60.23	$13,158	0.233	$3,066
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2035	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.220	$5,280
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	218.46	218.46	$61.73	$13,486	0.220	$2,967
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2036	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.207	$4,968
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	218.46	218.46	$63.28	$13,824	0.207	$2,861
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2037	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.196	$4,704
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	218.46	218.46	$64.86	$14,169	0.196	$2,777

	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2038	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.185	$4,440
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	218.46	218.46	$66.48	$14,523	0.185	$2,687
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2039	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.174	$4,176
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	218.46	218.46	$68.14	$14,887	0.174	$2,590
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2040	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.164	$3,936
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	319.59	319.59	$69.85	$22,322	0.164	$3,661
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2041	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.155	$3,720
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	319.59	319.59	$71.59	$22,880	0.155	$3,546
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2042	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.146	$3,504
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	319.59	319.59	$73.38	$23,452	0.146	$3,424
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2043	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.138	$3,312
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	319.59	319.59	$75.22	$24,039	0.138	$3,317
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2044	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.130	$3,120
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	319.59	319.59	$77.10	$24,640	0.130	$3,203
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							

	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2045	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.123	$2,952
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	319.59	319.59	$79.02	$25,256	0.123	$3,106
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2046	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.116	$2,784
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	319.59	319.59	$81.00	$25,887	0.116	$3,003
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2047	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.109	$2,616
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	319.59	319.59	$83.03	$26,534	0.109	$2,892
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2048	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.103	$2,472
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	319.59	319.59	$85.10	$27,197	0.103	$2,801
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2049	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.097	$2,328
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	319.59	319.59	$87.23	$27,877	0.097	$2,704
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2050	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.092	$2,208
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	419.38	419.38	$89.41	$37,497	0.092	$3,450
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2051	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.087	$2,088
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	419.38	419.38	$91.64	$38,434	0.087	$3,344
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2052	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.082	$1,968
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	419.38	419.38	$93.94	$39,395	0.082	$3,230

	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2053	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.077	$1,848
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	419.38	419.38	$96.28	$40,380	0.077	$3,109
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2054	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.073	$1,752
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	419.38	419.38	$98.69	$41,389	0.073	$3,021
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2055	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.069	$1,656
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	419.38	419.38	$101.16	$42,424	0.069	$2,927
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2056	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.065	$1,560
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	419.38	419.38	$103.69	$43,484	0.065	$2,826
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2057	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.061	$1,464
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	419.38	419.38	$106.28	$44,572	0.061	$2,719
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
2058	Passive use value associated with increases in forest biodiversity	Acres of additional forest habitat	0	200	200	$120	$24,000	0.058	$1,392
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	419.38	419.38	$108.94	$45,686	0.058	$2,650
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (See Narrative Text)							
Project Life								…	
								Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (i) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries	**$437,263**
Comments: See narrative description in Attachment 8 for a description of these benefits.									

(1) Complete these columns if dollar value is being claimed for the benefit.

Table 16 - Water Quality and Other Expected Benefits

(All benefits should be in 2009 dollars)

Project: 396--Copeland Creek Watershed Detention/Recharge, Habitat Restoration, and Steelhead Refugia Project, Sonoma County Water Agency

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit $ Value [1]	(h) Annual $ Value (f) x (g) [1]	(i) Discount Factor [1]	(j) Discounted Benefits (h) x (i) [1]
2009	No benefit								
2010	No benefit								
2011	No benefit								
2012	No benefit								
2013	No benefit								
2014	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.747	$1,882
	Avoided cost of sediment deposition	Avoided annual maintenance costs	0	1	1	$20,000	$20,000	0.747	$14,940
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	29.73	29.73	$36.76	$1,093	0.747	$816
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2015	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.705	$1,777
	Avoided cost of sediment deposition	Avoided annual maintenance costs	0	1	1	$20,000	$20,000	0.705	$14,100
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	29.73	29.73	$37.67	$1,120	0.705	$790
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2016	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.665	$1,676
	Avoided cost of sediment deposition	Avoided annual maintenance costs	0	1	1	$20,000	$20,000	0.665	$13,300
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	29.73	29.73	$38.62	$1,148	0.665	$763
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2017	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.627	$1,580
	Avoided cost of sediment deposition	Avoided annual maintenance costs	0	1	1	$20,000	$20,000	0.627	$12,540
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	29.73	29.73	$39.58	$1,177	0.627	$738
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2018	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.592	$1,492
	Avoided cost of sediment deposition	Avoided annual maintenance costs	0	1	1	$20,000	$20,000	0.592	$11,840
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	29.73	29.73	$40.57	$1,206	0.592	$714
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							

	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2019	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.558	$1,406
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	19.96	19.96	$41.59	$830	0.558	$463
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2020	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.527	$1,328
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	19.96	19.96	$42.63	$851	0.527	$448
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2021	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.497	$1,252
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	19.96	19.96	$43.69	$872	0.497	$433
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2022	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.469	$1,182
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	19.96	19.96	$44.78	$894	0.469	$419
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2023	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.442	$1,114
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	19.96	19.96	$45.90	$916	0.442	$405
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2024	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.417	$1,051
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	19.96	19.96	$47.05	$939	0.417	$392
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2025	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.394	$993
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	19.96	19.96	$48.23	$963	0.394	$379
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							

	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2026	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.371	$935
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	19.96	19.96	$49.43	$987	0.371	$366
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2027	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.350	$882
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	19.96	19.96	$50.67	$1,011	0.350	$354
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2028	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.331	$834
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	19.96	19.96	$51.93	$1,037	0.331	$343
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2029	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.312	$786
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	22.94	22.94	$53.23	$1,221	0.312	$381
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2030	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.294	$741
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	22.94	22.94	$54.56	$1,252	0.294	$368
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2031	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.278	$701
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	22.94	22.94	$55.93	$1,283	0.278	$357
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2032	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.262	$660
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	22.94	22.94	$57.33	$1,315	0.262	$345
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							

	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2033	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.247	$622
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	22.94	22.94	$58.76	$1,348	0.247	$333
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2034	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.233	$587
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	22.94	22.94	$60.23	$1,382	0.233	$322
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2035	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.220	$554
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	22.94	22.94	$61.73	$1,416	0.220	$312
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2036	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.207	$522
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	22.94	22.94	$63.28	$1,452	0.207	$300
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2037	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.196	$494
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	22.94	22.94	$64.86	$1,488	0.196	$292
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2038	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.185	$466
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	22.94	22.94	$66.48	$1,525	0.185	$282
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2039	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.174	$438
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	33.56	33.56	$68.14	$2,287	0.174	$398
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							

	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2040	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.164	$413
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	33.56	33.56	$69.85	$2,344	0.164	$384
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2041	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.155	$391
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	33.56	33.56	$71.59	$2,403	0.155	$372
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2042	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.146	$368
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	33.56	33.56	$73.38	$2,463	0.146	$360
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2043	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.138	$348
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	33.56	33.56	$75.22	$2,524	0.138	$348
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2044	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.130	$328
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	33.56	33.56	$77.10	$2,587	0.130	$336
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2045	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.123	$310
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	33.56	33.56	$79.02	$2,652	0.123	$326
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2046	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.116	$292
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	33.56	33.56	$81.00	$2,718	0.116	$315

	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2047	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.109	$275
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	33.56	33.56	$83.03	$2,786	0.109	$304
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2048	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.103	$260
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	33.56	33.56	$85.10	$2,856	0.103	$294
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2049	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.097	$244
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	44.04	44.04	$87.23	$3,842	0.097	$373
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2050	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.092	$232
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	44.04	44.04	$89.41	$3,938	0.092	$362
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2051	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.087	$219
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	44.04	44.04	$91.64	$4,036	0.087	$351
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2052	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.082	$207
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	44.04	44.04	$93.94	$4,137	0.082	$339
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2053	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.077	$194

	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	44.04	44.04	$96.28	$4,240	0.077	$327
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2054	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.073	$184
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	44.04	44.04	$98.69	$4,346	0.073	$317
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2055	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.069	$174
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	44.04	44.04	$101.16	$4,455	0.069	$307
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2056	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.065	$164
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	44.04	44.04	$103.69	$4,566	0.065	$297
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2057	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.061	$154
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	44.04	44.04	$106.28	$4,681	0.061	$286
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
2058	Passive-use value associated with increases in forest biodiversity	Acres of restored forest habitat	0	21	21	$120.00	$2,520	0.058	$146
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	44.04	44.04	$108.94	$4,798	0.058	$278
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced Human and Social Capital	Unquantifiable (See Narrative Text)							
	Value of design and planning for future stormwater detention basins	Unquantifiable (See Narrative Text)							
Project Life								…	
								Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (i) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries	**$115,368**
Comments: See narrative description in Attachment 8 for a description of these benefits.									

(1) Complete these columns if dollar value is being claimed for the benefit.

Table 16 - Water Quality and Other Expected Benefits

(All benefits should be in 2009 dollars)

Project: 289--Camp Creek Habitat Protection-Road Decommissioning Implementation Project, Karuk Tribe

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit $ Value (1)	(h) Annual $ Value (f) x (g) (1)	(i) Discount Factor (1)	(j) Discounted Benefits (h) x (i) (1)
2009	No benefits				0		$0	1.000	$0
2010	No benefits				0		$0	0.943	$0
2011	No benefits				0		$0	0.890	$0
2012	No benefits				0		$0	0.840	$0
2013	No benefits				0		$0	0.792	$0
2014	Avoided costs of Sediment Deposition	Tons of sediment removed	0	1,286	1,286	$11.28	$14,506	0.747	$10,836
	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.747	$224
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (See Narrative Text)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (See Narrative Text)							
2015	Avoided costs of Sediment Deposition	Tons of sediment removed	0	1,286	1,286	$11.28	$14,506	0.705	$10,227
	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.705	$211
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (See Narrative Text)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (See Narrative Text)							
2016	Avoided costs of Sediment Deposition	Tons of sediment removed	0	1,286	1,286	$11.28	$14,506	0.665	$9,647
	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.665	$199
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (See Narrative Text)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (See Narrative Text)							
2017	Avoided costs of Sediment Deposition	Tons of sediment removed	0	1,286	1,286	$11.28	$14,506	0.627	$9,095
	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.627	$188
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (See Narrative Text)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (See Narrative Text)							
2018	Avoided costs of Sediment Deposition	Tons of sediment removed	0	1,286	1,286	$11.28	$14,506	0.592	$8,588
	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.592	$177
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (See Narrative Text)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (See Narrative Text)							
2019	Avoided costs of Sediment Deposition	Tons of sediment removed	0	1,286	1,286	$11.28	$14,506	0.558	$8,094
	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.558	$167
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (See Narrative Text)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (See Narrative Text)							
2020	Avoided costs of Sediment Deposition	Tons of sediment removed	0	1,286	1,286	$11.28	$14,506	0.527	$7,645

	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.527	$158
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (See Narrative Text)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (See Narrative Text)							
2021	Avoided costs of Sediment Deposition	Tons of sediment removed	0	1,286	1,286	$11.28	$14,506	0.497	$7,210
	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.497	$149
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (See Narrative Text)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (See Narrative Text)							
2022	Avoided costs of Sediment Deposition	Tons of sediment removed	0	1,286	1,286	$11.28	$14,506	0.469	$6,803
	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.469	$140
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (See Narrative Text)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (See Narrative Text)							
2023	Avoided costs of Sediment Deposition	Tons of sediment removed	0	1,286	1,286	$11.28	$14,506	0.442	$6,412
	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.442	$132
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (See Narrative Text)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (See Narrative Text)							
2024	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.417	$125
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2025	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.394	$118
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2026	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.371	$111
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2027	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.350	$105
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							

	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2028	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.331	$99
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2029	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.312	$93
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2030	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.294	$88
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2031	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.278	$83
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2032	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.262	$78
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2033	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.247	$74
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2034	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.233	$70
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2035	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.220	$66
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							

	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2036	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.207	$62
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2037	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.196	$59
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2038	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.185	$55
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2039	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.174	$52
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2040	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.164	$49
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2041	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.155	$46
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2042	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.146	$44
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2043	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.138	$41

	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2044	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.130	$39
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2045	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.123	$37
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2046	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.116	$35
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2047	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.109	$33
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2048	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.103	$31
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2049	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$11	$28	0.097	$3
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)				$120			
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2050	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.092	$28
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							

2051	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.087	$26
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2052	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.082	$25
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2053	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.077	$23
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2054	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.073	$22
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2055	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.069	$21
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2056	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.065	$19
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2057	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.061	$18
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							
	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
2058	Passive-use value associated with increases in forest biodiversity	Acres of upland forest habitat restored	0	2.5	2.5	$120	$299	0.058	$17
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Reduced risk of introduction and spread of invasive species	Unquantifiable (see narrative description)							

	Potential to leverage funds for additional sediment-removal activities	Unquantifiable (see narrative description)							
Project Life									
								Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries	**$88,194**
Comments: See narrative description in Attachment 8 for a description of these benefits.									

(1) Complete these columns if dollar value is being claimed for the benefit.

Table 16 - Water Quality and Other Expected Benefits

(All benefits should be in 2009 dollars)

Project: 311--Indian Creek Sewer Pipeline Crossing, Happy Camp Sanitary District

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit $ Value (1)	(h) Annual $ Value (f) x (g) (1)	(i) Discount Factor (1)	(j) Discounted Benefits (h) x (i) (1)
2009	No benefit								
2010	No benefit								
2011	Avoided costs of administrative civil liability action fines	Fines for non-compliance, given probability of failure within 50 years	0	0.02	0.02	$150,000	$3,000	0.890	$2,670
	Avoided costs of emergency repair	Emergency cost to undertake emergency repairs, given probability of failure within 50 years	0	0.02	0.02	$1,010,300	$20,206	0.890	$17,983
	Avoided cost of a service disruption	Unquantifiable (See Narrative Text)							
	Avoided disruption of recreation activities in Indian Creek	Unquantifiable (See Narrative Text)							
	Passive-use value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
2012	Avoided costs of administrative civil liability action fines	Fines for non-compliance, given probability of failure within 50 years	0	0.02	0.02	$150,000	$3,000	0.840	$2,520
	Avoided costs of emergency repair	Emergency cost to undertake emergency repairs, given probability of failure within 50 years	0	0.02	0.02	$1,010,300	$20,206	0.840	$16,973
	Avoided cost of a service disruption	Unquantifiable (See Narrative Text)							
	Avoided disruption of recreation activities in Indian Creek	Unquantifiable (See Narrative Text)							
	Passive-use value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
2013	Avoided costs of administrative civil liability action fines	Fines for non-compliance, given probability of failure within 50 years	0	0.02	0.02	$150,000	$3,000	0.792	$2,376
	Avoided costs of emergency repair	Emergency cost to undertake emergency repairs, given probability of failure within 50 years	0	0.02	0.02	$1,010,300	$20,206	0.792	$16,003
	Avoided cost of a service disruption	Unquantifiable (See Narrative Text)							
	Avoided disruption of recreation activities in Indian Creek	Unquantifiable (See Narrative Text)							
	Passive-use value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
2014	Avoided costs of administrative civil liability action fines	Fines for non-compliance, given probability of failure within 50 years	0	0.02	0.02	$150,000	$3,000	0.747	$2,241
	Avoided costs of emergency repair	Emergency cost to undertake emergency repairs, given probability of failure within 50 years	0	0.02	0.02	$1,010,300	$20,206	0.747	$15,094
	Avoided cost of a service disruption	Unquantifiable (See Narrative Text)							
	Avoided disruption of recreation activities in Indian Creek	Unquantifiable (See Narrative Text)							
	Passive-use value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
2015	Avoided costs of administrative civil liability action fines	Fines for non-compliance, given probability of failure within 50 years	0	0.02	0.02	$150,000	$3,000	0.705	$2,115
	Avoided costs of emergency repair	Emergency cost to undertake emergency repairs, given probability of failure within 50 years	0	0.02	0.02	$1,010,300	$20,206	0.705	$14,245
	Avoided cost of a service disruption	Unquantifiable (See Narrative Text)							
	Avoided disruption of recreation activities in Indian Creek	Unquantifiable (See Narrative Text)							
	Passive-use value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
2016	Avoided costs of administrative civil liability action fines	Fines for non-compliance, given probability of failure within 50 years	0	0.02	0.02	$150,000	$3,000	0.665	$1,995
	Avoided costs of emergency repair	Emergency cost to undertake emergency repairs, given probability of failure within 50 years	0	0.02	0.02	$1,010,300	$20,206	0.665	$13,437
	Avoided cost of a service disruption	Unquantifiable (See Narrative Text)							
	Avoided disruption of recreation activities in Indian Creek	Unquantifiable (See Narrative Text)							
	Passive-use value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							

2017	Avoided costs of administrative civil liability action fines	Fines for non-compliance, given probability of failure within 50 years	0	0.02	0.02	$150,000	$3,000	0.627	$1,881
	Avoided costs of emergency repair	Emergency cost to undertake emergency repairs, given probability of failure within 50 years	0	0.02	0.02	$1,010,300	$20,206	0.627	$12,669
	Avoided cost of a service disruption	Unquantifiable (See Narrative Text)							
	Avoided disruption of recreation activities in Indian Creek	Unquantifiable (See Narrative Text)							
	Passive-use value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
2018	Avoided costs of administrative civil liability action fines	Fines for non-compliance, given probability of failure within 50 years	0	0.02	0.02	$150,000	$3,000	0.592	$1,776
	Avoided costs of emergency repair	Emergency cost to undertake emergency repairs, given probability of failure within 50 years	0	0.02	0.02	$1,010,300	$20,206	0.592	$11,962
	Avoided cost of a service disruption	Unquantifiable (See Narrative Text)							
	Avoided disruption of recreation activities in Indian Creek	Unquantifiable (See Narrative Text)							
	Passive-use value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
2019	Avoided costs of administrative civil liability action fines	Fines for non-compliance, given probability of failure within 50 years	0	0.02	0.02	$150,000	$3,000	0.558	$1,674
	Avoided costs of emergency repair	Emergency cost to undertake emergency repairs, given probability of failure within 50 years	0	0.02	0.02	$1,010,300	$20,206	0.558	$11,275
	Avoided cost of a service disruption	Unquantifiable (See Narrative Text)							
	Avoided disruption of recreation activities in Indian Creek	Unquantifiable (See Narrative Text)							
	Passive-use value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
2020	Avoided costs of administrative civil liability action fines	Fines for non-compliance, given probability of failure within 50 years	0	0.02	0.02	$150,000	$3,000	0.527	$1,581
	Avoided costs of emergency repair	Emergency cost to undertake emergency repairs, given probability of failure within 50 years	0	0.02	0.02	$1,010,300	$20,206	0.527	$10,649
	Avoided cost of a service disruption	Unquantifiable (See Narrative Text)							
	Avoided disruption of recreation activities in Indian Creek	Unquantifiable (See Narrative Text)							
	Passive-use value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
2021	Avoided costs of administrative civil liability action fines	Fines for non-compliance, given probability of failure within 50 years	0	0.02	0.02	$150,000	$3,000	0.497	$1,491
	Avoided costs of emergency repair	Emergency cost to undertake emergency repairs, given probability of failure within 50 years	0	0.02	0.02	$1,010,300	$20,206	0.497	$10,042
	Avoided cost of a service disruption	Unquantifiable (See Narrative Text)							
	Avoided disruption of recreation activities in Indian Creek	Unquantifiable (See Narrative Text)							
	Passive-use value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
2022	Avoided costs of administrative civil liability action fines	Fines for non-compliance, given probability of failure within 50 years	0	0.02	0.02	$150,000	$3,000	0.469	$1,407
	Avoided costs of emergency repair	Emergency cost to undertake emergency repairs, given probability of failure within 50 years	0	0.02	0.02	$1,010,300	$20,206	0.469	$9,477
	Avoided cost of a service disruption	Unquantifiable (See Narrative Text)							
	Avoided disruption of recreation activities in Indian Creek	Unquantifiable (See Narrative Text)							
	Passive-use value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
2023	Avoided costs of administrative civil liability action fines	Fines for non-compliance, given probability of failure within 50 years	0	0.02	0.02	$150,000	$3,000	0.442	$1,326
	Avoided costs of emergency repair	Emergency cost to undertake emergency repairs, given probability of failure within 50 years	0	0.02	0.02	$1,010,300	$20,206	0.442	$8,931
	Avoided cost of a service disruption	Unquantifiable (See Narrative Text)							
	Avoided disruption of recreation activities in Indian Creek	Unquantifiable (See Narrative Text)							
	Passive-use value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							

	Cultural value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
2024	Avoided costs of administrative civil liability action fines	Fines for non-compliance, given probability of failure within 50 years	0	0.02	0.02	$150,000	$3,000	0.417	$1,251
	Avoided costs of emergency repair	Emergency cost to undertake emergency repairs, given probability of failure within 50 years	0	0.02	0.02	$1,010,300	$20,206	0.417	$8,426
	Avoided cost of a service disruption	Unquantifiable (See Narrative Text)							
	Avoided disruption of recreation activities in Indian Creek	Unquantifiable (See Narrative Text)							
	Passive-use value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
2025	Avoided costs of administrative civil liability action fines	Fines for non-compliance, given probability of failure within 50 years	0	0.02	0.02	$150,000	$3,000	0.394	$1,182
	Avoided costs of emergency repair	Emergency cost to undertake emergency repairs, given probability of failure within 50 years	0	0.02	0.02	$1,010,300	$20,206	0.394	$7,961
	Avoided cost of a service disruption	Unquantifiable (See Narrative Text)							
	Avoided disruption of recreation activities in Indian Creek	Unquantifiable (See Narrative Text)							
	Passive-use value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
2026	Avoided costs of administrative civil liability action fines	Fines for non-compliance, given probability of failure within 50 years	0	0.02	0.02	$150,000	$3,000	0.371	$1,113
	Avoided costs of emergency repair	Emergency cost to undertake emergency repairs, given probability of failure within 50 years	0	0.02	0.02	$1,010,300	$20,206	0.371	$7,496
	Avoided cost of a service disruption	Unquantifiable (See Narrative Text)							
	Avoided disruption of recreation activities in Indian Creek	Unquantifiable (See Narrative Text)							
	Passive-use value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
2027	Avoided costs of administrative civil liability action fines	Fines for non-compliance, given probability of failure within 50 years	0	0.02	0.02	$150,000	$3,000	0.350	$1,050
	Avoided costs of emergency repair	Emergency cost to undertake emergency repairs, given probability of failure within 50 years	0	0.02	0.02	$1,010,300	$20,206	0.350	$7,072
	Avoided cost of a service disruption	Unquantifiable (See Narrative Text)							
	Avoided disruption of recreation activities in Indian Creek	Unquantifiable (See Narrative Text)							
	Passive-use value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
2028	Avoided costs of administrative civil liability action fines	Fines for non-compliance, given probability of failure within 50 years	0	0.02	0.02	$150,000	$3,000	0.331	$993
	Avoided costs of emergency repair	Emergency cost to undertake emergency repairs, given probability of failure within 50 years	0	0.02	0.02	$1,010,300	$20,206	0.331	$6,688
	Avoided cost of a service disruption	Unquantifiable (See Narrative Text)							
	Avoided disruption of recreation activities in Indian Creek	Unquantifiable (See Narrative Text)							
	Passive-use value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
2029	Avoided costs of administrative civil liability action fines	Fines for non-compliance, given probability of failure within 50 years	0	0.02	0.02	$150,000	$3,000	0.312	$936
	Avoided costs of emergency repair	Emergency cost to undertake emergency repairs, given probability of failure within 50 years	0	0.02	0.02	$1,010,300	$20,206	0.312	$6,304
	Avoided cost of a service disruption	Unquantifiable (See Narrative Text)							
	Avoided disruption of recreation activities in Indian Creek	Unquantifiable (See Narrative Text)							
	Passive-use value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
2030	Avoided costs of administrative civil liability action fines	Fines for non-compliance, given probability of failure within 50 years	0	0.02	0.02	$150,000	$3,000	0.294	$882
	Avoided costs of emergency repair	Emergency cost to undertake emergency repairs, given probability of failure within 50 years	0	0.02	0.02	$1,010,300	$20,206	0.294	$5,941
	Avoided cost of a service disruption	Unquantifiable (See Narrative Text)							
	Avoided disruption of recreation activities in Indian Creek	Unquantifiable (See Narrative Text)							

	Passive-use value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
2031	Avoided costs of administrative civil liability action fines	Fines for non-compliance, given probability of failure within 50 years	0	0.02	0.02	$150,000	$3,000	0.278	$834
	Avoided costs of emergency repair	Emergency cost to undertake emergency repairs, given probability of failure within 50 years	0	0.02	0.02	$1,010,300	$20,206	0.278	$5,617
	Avoided cost of a service disruption	Unquantifiable (See Narrative Text)							
	Avoided disruption of recreation activities in Indian Creek	Unquantifiable (See Narrative Text)							
	Passive-use value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
2032	Avoided costs of administrative civil liability action fines	Fines for non-compliance, given probability of failure within 50 years	0	0.02	0.02	$150,000	$3,000	0.262	$786
	Avoided costs of emergency repair	Emergency cost to undertake emergency repairs, given probability of failure within 50 years	0	0.02	0.02	$1,010,300	$20,206	0.262	$5,294
	Avoided cost of a service disruption	Unquantifiable (See Narrative Text)							
	Avoided disruption of recreation activities in Indian Creek	Unquantifiable (See Narrative Text)							
	Passive-use value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
2033	Avoided costs of administrative civil liability action fines	Fines for non-compliance, given probability of failure within 50 years	0	0.02	0.02	$150,000	$3,000	0.247	$741
	Avoided costs of emergency repair	Emergency cost to undertake emergency repairs, given probability of failure within 50 years	0	0.02	0.02	$1,010,300	$20,206	0.247	$4,991
	Avoided cost of a service disruption	Unquantifiable (See Narrative Text)							
	Avoided disruption of recreation activities in Indian Creek	Unquantifiable (See Narrative Text)							
	Passive-use value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with avoiding harm to salmon populations	Unquantifiable (See Narrative Text)							
Project Life								…	
								Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries	**$269,352**
Comments: See narrative description in Attachment 8 for a description of these benefits.									

(1) Complete these columns if dollar value is being claimed for the benefit.

Table 16 - Water Quality and Other Expected Benefits

(All benefits should be in 2009 dollars)

Project: 306--Water Treatment System Upgrade, Happy Camp Community Services District

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit $ Value [1]	(h) Annual $ Value (f) x (g) [1]	(i) Discount Factor [1]	(j) Discounted Benefits (h) x (i) [1]
2009	No Benefit							1.000	$0
2010	No Benefit							0.943	$0
2011	No Benefit							0.890	$0
2012	No Benefit							0.840	$0
2013	Avioded Costs of Non-Compliance with Drinking Water Regulations	Fines for non-compliance	0	1	1	$200	$200	0.792	$158
	Increased Drinking Water Quality	Unquantifiable (See Narrative Text)							
2014	Avioded Costs of Non-Compliance with Drinking Water Regulations	Fines for non-compliance	0	1	1	$200	$200	0.747	$149
	Increased Drinking Water Quality	Unquantifiable (See Narrative Text)							
2015	Avioded Costs of Non-Compliance with Drinking Water Regulations	Fines for non-compliance	0	1	1	$200	$200	0.705	$141
	Increased Drinking Water Quality	Unquantifiable (See Narrative Text)							
2016	Avioded Costs of Non-Compliance with Drinking Water Regulations	Fines for non-compliance	0	1	1	$200	$200	0.665	$133
	Increased Drinking Water Quality	Unquantifiable (See Narrative Text)							
2017	Avioded Costs of Non-Compliance with Drinking Water Regulations	Fines for non-compliance	0	1	1	$200	$200	0.627	$125
	Increased Drinking Water Quality	Unquantifiable (See Narrative Text)							
2018	Avioded Costs of Non-Compliance with Drinking Water Regulations	Fines for non-compliance	0	1	1	$200	$200	0.592	$118
	Increased Drinking Water Quality	Unquantifiable (See Narrative Text)							
2019	Avioded Costs of Non-Compliance with Drinking Water Regulations	Fines for non-compliance	0	1	1	$200	$200	0.558	$112
	Increased Drinking Water Quality	Unquantifiable (See Narrative Text)							
2020	Avioded Costs of Non-Compliance with Drinking Water Regulations	Fines for non-compliance	0	1	1	$200	$200	0.527	$105
	Increased Drinking Water Quality	Unquantifiable (See Narrative Text)							
2021	Avioded Costs of Non-Compliance with Drinking Water Regulations	Fines for non-compliance	0	1	1	$200	$200	0.497	$99
	Increased Drinking Water Quality	Unquantifiable (See Narrative Text)							
2022	Avioded Costs of Non-Compliance with Drinking Water Regulations	Fines for non-compliance	0	1	1	$200	$200	0.469	$94
	Increased Drinking Water Quality	Unquantifiable (See Narrative Text)							
2023	Avioded Costs of Non-Compliance with Drinking Water Regulations	Fines for non-compliance	0	1	1	$200	$200	0.442	$88
	Increased Drinking Water Quality	Unquantifiable (See Narrative Text)							
2024	Avioded Costs of Non-Compliance with Drinking Water Regulations	Fines for non-compliance	0	1	1	$200	$200	0.417	$83
	Increased Drinking Water Quality	Unquantifiable (See Narrative Text)							
2025	Avioded Costs of Non-Compliance with Drinking Water Regulations	Fines for non-compliance	0	1	1	$200	$200	0.394	$79
	Increased Drinking Water Quality	Unquantifiable (See Narrative Text)							
2026	Avioded Costs of Non-Compliance with Drinking Water Regulations	Fines for non-compliance	0	1	1	$200	$200	0.371	$74
	Increased Drinking Water Quality	Unquantifiable (See Narrative Text)							
2027	Avioded Costs of Non-Compliance with Drinking Water Regulations	Fines for non-compliance	0	1	1	$200	$200	0.350	$70
	Increased Drinking Water Quality	Unquantifiable (See Narrative Text)							
2028	Avioded Costs of Non-Compliance with Drinking Water Regulations	Fines for non-compliance	0	1	1	$200	$200	0.331	$66
	Increased Drinking Water Quality	Unquantifiable (See Narrative Text)							
2029	Avioded Costs of Non-Compliance with Drinking Water Regulations	Fines for non-compliance	0	1	1	$200	$200	0.312	$62
	Increased Drinking Water Quality	Unquantifiable (See Narrative Text)							
2030	Avioded Costs of Non-Compliance with Drinking Water Regulations	Fines for non-compliance	0	1	1	$200	$200	0.294	$59
	Increased Drinking Water Quality	Unquantifiable (See Narrative Text)							
2031	Avioded Costs of Non-Compliance with Drinking Water Regulations	Fines for non-compliance	0	1	1	$200	$200	0.278	$56

	Increased Drinking Water Quality	Unquantifiable (See Narrative Text)							
2032	Avioded Costs of Non-Compliance with Drinking Water Regulations	Fines for non-compliance	0	1	1	$200	$200	0.262	$52
	Increased Drinking Water Quality	Unquantifiable (See Narrative Text)							
2033	Avioded Costs of Non-Compliance with Drinking Water Regulations	Fines for non-compliance	0	1	1	$200	$200	0.247	$49
	Increased Drinking Water Quality	Unquantifiable (See Narrative Text)							
Project Life								…	
								Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries	**$1,975**
Comments: See narrative description in Attachment 8 for a description of these benefits.									

(1) Complete these columns if dollar value is being claimed for the benefit.

Table 16 - Water Quality and Other Expected Benefits

(All benefits should be in 2009 dollars)

Project: 408--Del Norte Agricultural Enhancement Program, Del Norte Resource Conservation District

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit $ Value [1]	(h) Annual $ Value (f) x (g) [1]	(i) Discount Factor [1]	(j) Discounted Benefits (h) x (i) [1]
2009	No benefit								
2010	No benefit								
2011	No benefit								
2012	No benefit								
2013	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Avoided water-treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2014	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Avoided water-treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2015	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.705	$4,974
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2016	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.665	$4,692
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2017	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.627	$4,424
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2018	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.592	$4,177
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2019	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.558	$3,937
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2020	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.527	$3,719
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2021	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.497	$3,507
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							

	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2022	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.469	$3,309
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2023	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.442	$3,119
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2024	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.417	$2,942
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2025	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.394	$2,780
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2026	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.371	$2,618
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2027	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.350	$2,470
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2028	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.331	$2,336
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2029	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.312	$2,201
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2030	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.294	$2,074
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							

2031	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.278	$1,962
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2032	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.262	$1,849
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2033	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.247	$1,743
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2034	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.233	$1,644
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2035	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.220	$1,552
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2036	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.207	$1,461
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2037	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.196	$1,383
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2038	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.185	$1,305
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2039	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.174	$1,228
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2040	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.164	$1,157
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							

	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2041	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.155	$1,094
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2042	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.146	$1,030
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2043	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.138	$974
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2044	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.130	$917
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2045	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.123	$868
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2046	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.116	$818
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2047	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.109	$769
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2048	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.103	$727
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2049	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.097	$684
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2050	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.092	$649

	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2051	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.087	$614
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2052	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.082	$579
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2053	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.077	$543
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2054	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.073	$515
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2055	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.069	$487
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2056	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.065	$459
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2057	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.061	$430
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
2058	Avoided cost of noncompliance	Noncompliance fee per dairy owner	0	3	3	$2,352	$7,056	0.058	$409
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
	Reduced treatment and compliance costs for downstream users	Unquantifiable (See Narrative Text)							
Project Life								…	
								Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (i) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries	**$81,130**
Comments: See narrative description in Attachment 8 for a description of these benefits.									

(1) Complete these columns if dollar value is being claimed for the benefit.

Table 16 - Water Quality and Other Expected Benefits

(All benefits should be in 2009 dollars)

Project: 355--Real-Time Weather Data for Irrigation Water Management, Del Norte Resource Conservation District

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit $ Value (1)	(h) Annual $ Value (f) x (g) (1)	(i) Discount Factor (1)	(j) Discounted Benefits (h) x (i) (1)
2009								1.000	$0
								1.000	$0
2010								0.943	$0
								0.943	$0
2011	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)			0			0.890	
	Cultrual value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)			0			0.890	
2012	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)			0			0.840	
	Cultrual value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)			0			0.840	
2013	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)			0			0.792	
	Cultrual value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)			0			0.792	
2014	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)			0			0.747	
	Cultrual value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)			0			0.747	
2015	Passive-use value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)			0			0.705	
	Cultrual value associated with increases in salmonid populations	Unquantifiable (See Narrative Text)			0			0.705	
Project Life									
								Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries	

Comments: See narrative description in Attachment 8 for a description of these benefits.

(1) Complete these columns if dollar value is being claimed for the benefit.

Table 16 - Water Quality and Other Expected Benefits

(All benefits should be in 2009 dollars)

Project: 352–Gualala River Sediment Reduction Program, Gualala River Watershed Council

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit $ Value (1)	(h) Annual $ Value (f) x (g) (1)	(i) Discount Factor (1)	(j) Discounted Benefits (h) x (i) (1)
2009	No benefits				0		$0	1.000	$0
2010	No benefits				0		$0	0.943	$0
2011	No benefits				0		$0	0.890	$0
2012	No benefits				0		$0	0.840	$0
2013	No benefits				0		$0	0.792	$0
2014	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	2,820	2,820	$11.28	$31,810	0.747	$23,762
	Passive use value associated with increases in salmon populations	Additional fish	0	107	107	$2,000	$214,000	0.747	$159,858
	Avoided cost of road maintenance	Miles of road on which costs would be avoided	0	12	12	$2,500	$30,000	0.747	$22,410
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2015	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	2,820	2,820	$11.28	$31,810	0.705	$22,426
	Passive use value associated with increases in salmon populations	Additional fish	0	214	214	$2,000	$428,000	0.705	$301,740
	Avoided cost of road maintenance	Miles of road on which costs would be avoided	0	12	12	$2,625	$31,500	0.705	$22,208
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2016	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	2,820	2,820	$11.28	$31,810	0.665	$21,153
	Passive use value associated with increases in salmon populations	Additional fish	0	321	321	$2,000	$642,000	0.665	$426,930
	Avoided cost of road maintenance	Miles of road on which costs would be avoided	0	12	12	$2,756	$33,075	0.665	$21,995
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2017	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	2,820	2,820	$11.28	$31,810	0.627	$19,945
	Passive use value associated with increases in salmon populations	Additional fish	0	428	428	$2,000	$856,000	0.627	$536,712
	Avoided cost of road maintenance	Miles of road on which costs would be avoided	0	12	12	$2,894	$34,729	0.627	$21,775
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2018	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	2,820	2,820	$11.28	$31,810	0.592	$18,831
	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.592	$633,440
	Avoided cost of road maintenance	Miles of road on which costs would be avoided	0	12	12	$3,039	$36,465	0.592	$21,587
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2019	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	2,820	2,820	$11.28	$31,810	0.558	$17,750
	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.558	$597,060
	Avoided cost of road maintenance	Miles of road on which costs would be avoided	0	12	12	$3,191	$38,288	0.558	$21,365
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2020	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	2,820	2,820	$11.28	$31,810	0.527	$16,764
	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.527	$563,890
	Avoided cost of road maintenance	Miles of road on which costs would be avoided	0	12	12	$3,350	$40,203	0.527	$21,187
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2021	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	2,820	2,820	$11.28	$31,810	0.497	$15,809
	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.497	$531,790
	Avoided cost of road maintenance	Miles of road on which costs would be avoided	0	12	12	$3,518	$42,213	0.497	$20,980
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2022	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	2,820	2,820	$11.28	$31,810	0.469	$14,919
	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.469	$501,830
	Avoided cost of road maintenance	Miles of road on which costs would be avoided	0	12	12	$3,694	$44,324	0.469	$20,788
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							

	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2023	Avoided Costs of Sediment Deposition	Tons of sediment removed	0	2,820	2,820	$11.28	$31,810	0.442	$14,060
	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.442	$472,940
	Avoided cost of road maintenance	Miles of road on which costs would be avoided	0	12	12	$3,878	$46,540	0.442	$20,571
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2024	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.417	$446,190
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2025	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.394	$421,580
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2026	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.371	$396,970
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2027	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.350	$374,500
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2028	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.331	$354,170
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2029	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.312	$333,840
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2030	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.294	$314,580
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2031	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.278	$297,460
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2032	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.262	$280,340
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2033	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.247	$264,290
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2034	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.233	$249,310
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2035	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.220	$235,400
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2036	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.207	$221,490
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2037	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.196	$209,720
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							

	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2038	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.185	$197,950
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2039	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.174	$186,180
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2040	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.164	$175,480
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2041	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.155	$165,850
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2042	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.146	$156,220
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2043	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.138	$147,660
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2044	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.130	$139,100
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2045	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.123	$131,610
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2046	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.116	$124,120
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2047	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.109	$116,630
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2048	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.103	$110,210
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2049	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.097	$103,790
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2050	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.092	$98,440
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2051	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.087	$93,090
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2052	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.082	$87,740
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2053	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.077	$82,390

	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2054	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.073	$78,110
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2055	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.069	$73,830
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2056	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.065	$69,550
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2057	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.061	$65,270
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
2058	Passive use value associated with increases in salmon populations	Additional fish	0	535	535	$2,000	$1,070,000	0.058	$62,060
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Enhanced human and social capital	Unquantifiable (See Narrative Text)							
								Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries	**$11,991,593**
Comments: See narrative description in Attachment 8 for a description of these benefits.									

(1) Complete these columns if dollar value is being claimed for the benefit.

Table 16 - Water Quality and Other Expected Benefits

(All benefits should be in 2009 dollars)

Project: 444--S. Mattole Integrated Watershed Management Initiative, Mattole Restoration Council

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit $ Value [1]	(h) Annual $ Value (f) x (g) [1]	(i) Discount Factor [1]	(j) Discounted Benefits (h) x (i) [1]
2009	No benefit								
2010	No benefit								
2011	No benefit								
2012	No benefit								
2013	No benefit								
2014	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.747	$4,482
	Passive-use value associated with increases in salmon populations	Additional fish	0	132	132	$2,000	$264,000	0.747	$197,208
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	70.8	70.8	$36.76	$2,602	0.747	$1,944
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.747	$11,940
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2015	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.705	$4,230
	Passive-use value associated with increases in salmon populations	Additional fish	0	203	203	$2,000	$406,000	0.705	$286,230
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	70.8	70.8	$37.67	$2,667	0.705	$1,880
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.705	$11,269
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2016	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.665	$3,990
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.665	$319,200
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	70.8	70.8	$38.62	$2,734	0.665	$1,818
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.665	$10,629
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2017	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.627	$3,762
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.627	$300,960
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	70.8	70.8	$39.58	$2,802	0.627	$1,757
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.627	$10,022
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2018	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.592	$3,552
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.592	$284,160
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	70.8	70.8	$40.57	$2,872	0.592	$1,700
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.592	$9,462
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							

	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2019	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.558	$3,348
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.558	$267,840
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	47.53	47.53	$41.59	$1,977	0.558	$1,103
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.558	$8,919
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2020	Passive use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.527	$3,162
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.527	$252,960
	Avoided costs of adjudication	Avoided legal fee	0	1	1	$100,000	$100,000	0.527	$52,700
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	47.53	47.53	$42.63	$2,026	0.527	$1,068
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.527	$8,423
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory and legal enforcement	Unquantifiable (See Narrative Text)							
	Value associated with increase in number of recreation days	Unquantifiable (See Narrative Text)							
2021	Passive use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.497	$2,982
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.497	$238,560
	Avoided costs of adjudication	Avoided legal fee	0	1	1	$100,000	$100,000	0.497	$49,700
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	47.53	47.53	$43.69	$2,077	0.497	$1,032
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.497	$7,944
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory and legal enforcement	Unquantifiable (See Narrative Text)							
	Value associated with increase in number of recreation days	Unquantifiable (See Narrative Text)							
2022	Passive use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.469	$2,814
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.469	$225,120
	Avoided costs of adjudication	Avoided legal fee	0	1	1	$100,000	$100,000	0.469	$46,900
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	47.53	47.53	$44.78	$2,129	0.469	$998
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.469	$7,496
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory and legal enforcement	Unquantifiable (See Narrative Text)							
	Value associated with increase in number of recreation days	Unquantifiable (See Narrative Text)							
2023	Passive use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.442	$2,652
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.442	$212,160
	Avoided costs of adjudication	Avoided legal fee	0	1	1	$100,000	$100,000	0.442	$44,200
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	47.53	47.53	$45.90	$2,182	0.442	$964
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.442	$7,065
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							

	Avoided costs of regulatory and legal enforcement	Unquantifiable (See Narrative Text)							
	Value associated with increase in number of recreation days	Unquantifiable (See Narrative Text)							
2024	Passive use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.417	$2,502
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.417	$200,160
	Avoided costs of adjudication	Avoided legal fee	0	1	1	$100,000	$100,000	0.417	$41,700
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	47.53	47.53	$47.05	$2,236	0.417	$933
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.417	$6,665
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory and legal enforcement	Unquantifiable (See Narrative Text)							
	Value associated with increase in number of recreation days	Unquantifiable (See Narrative Text)							
2025	Passive use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.394	$2,364
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.394	$189,120
	Avoided costs of adjudication	Avoided legal fee	0	1	1	$100,000	$100,000	0.394	$39,400
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	47.53	47.53	$48.23	$2,292	0.394	$903
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.394	$6,298
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory and legal enforcement	Unquantifiable (See Narrative Text)							
	Value associated with increase in number of recreation days	Unquantifiable (See Narrative Text)							
2026	Passive use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.371	$2,226
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.371	$178,080
	Avoided costs of adjudication	Avoided legal fee	0	1	1	$100,000	$100,000	0.371	$37,100
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	47.53	47.53	$49.43	$2,350	0.371	$872
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.371	$5,930
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory and legal enforcement	Unquantifiable (See Narrative Text)							
	Value associated with increase in number of recreation days	Unquantifiable (See Narrative Text)							
2027	Passive use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.350	$2,100
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.350	$168,000
	Avoided costs of adjudication	Avoided legal fee	0	1	1	$100,000	$100,000	0.350	$35,000
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	47.53	47.53	$50.67	$2,408	0.350	$843
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.350	$5,594
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory and legal enforcement	Unquantifiable (See Narrative Text)							
	Value associated with increase in number of recreation days	Unquantifiable (See Narrative Text)							
2028	Passive use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.331	$1,986
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.331	$158,880
	Avoided costs of adjudication	Avoided legal fee	0	1	1	$100,000	$100,000	0.331	$33,100
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	47.53	47.53	$51.93	$2,468	0.331	$817
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.331	$5,291
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							

	Avoided costs of regulatory and legal enforcement	Unquantifiable (See Narrative Text)							
	Value associated with increase in number of recreation days	Unquantifiable (See Narrative Text)							
2029	Passive use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.312	$1,872
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.312	$149,760
	Avoided costs of water adjudication	Avoided costs of adjudication	0	1	1	$100,000	$100,000	0.312	$31,200
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	54.61	54.61	$53.23	$2,907	0.312	$907
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.312	$4,987
	Cultural value associated with increases in forest biodiversity	Unquantifiable (see narrative description)							
	Cultural value associated with increases in salmon populations	Unquantifiable (see narrative description)							
	Value associated with increase in number of recreation days	Unquantifiable (see narrative description)							
	Value associated with increase in number of recreation days	Unquantifiable (see narrative description)							
2030	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.294	$1,764
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.294	$141,120
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	54.61	54.61	$54.56	$2,980	0.294	$876
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.294	$4,699
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2031	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.278	$1,668
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.278	$133,440
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	54.61	54.61	$55.93	$3,054	0.278	$849
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.278	$4,443
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2032	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.262	$1,572
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.262	$125,760
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	54.61	54.61	$57.33	$3,131	0.262	$820
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.262	$4,188
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2033	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.247	$1,482
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.247	$118,560
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	54.61	54.61	$58.76	$3,209	0.247	$793
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.247	$3,948
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2034	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.233	$1,398
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.233	$111,840

	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	54.61	54.61	$60.23	$3,289	0.233	$766
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.233	$3,724
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2035	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.220	$1,320
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.220	$105,600
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	54.61	54.61	$61.73	$3,371	0.220	$742
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.220	$3,516
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2036	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.207	$1,242
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.207	$99,360
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	54.61	54.61	$63.28	$3,456	0.207	$715
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.207	$3,309
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2037	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.196	$1,176
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.196	$94,080
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	54.61	54.61	$64.86	$3,542	0.196	$694
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.196	$3,133
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2038	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.185	$1,110
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.185	$88,800
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	54.61	54.61	$66.48	$3,631	0.185	$672
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.185	$2,957
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2039	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.174	$1,044
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.174	$83,520
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	79.9	79.9	$68.14	$5,445	0.174	$947
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.174	$2,781
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							

	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2040	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.164	$984
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.164	$78,720
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	79.9	79.9	$69.85	$5,581	0.164	$915
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.164	$2,621
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2041	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.155	$930
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.155	$74,400
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	79.9	79.9	$71.59	$5,720	0.155	$887
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.155	$2,477
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2042	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.146	$876
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.146	$70,080
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	79.9	79.9	$73.38	$5,863	0.146	$856
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.146	$2,334
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2043	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.138	$828
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.138	$66,240
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	79.9	79.9	$75.22	$6,010	0.138	$829
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.138	$2,206
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2044	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.130	$780
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.130	$62,400
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	79.9	79.9	$77.10	$6,160	0.130	$801
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.130	$2,078
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2045	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.123	$738
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.123	$59,040
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	79.9	79.9	$79.02	$6,314	0.123	$777
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.123	$1,966

	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2046	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.116	$696
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.116	$55,680
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	79.9	79.9	$81.00	$6,472	0.116	$751
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.116	$1,854
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2047	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.109	$654
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.109	$52,320
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	79.9	79.9	$83.03	$6,634	0.109	$723
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.109	$1,742
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2048	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.103	$618
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.103	$49,440
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	79.9	79.9	$85.10	$6,800	0.103	$700
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.103	$1,646
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2049	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.097	$582
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.097	$46,560
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	104.85	104.85	$87.23	$9,146	0.097	$887
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.097	$1,550
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2050	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.092	$552
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.092	$44,160
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	104.85	104.85	$89.41	$9,375	0.092	$862
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.092	$1,471
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2051	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.087	$522

	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.087	$41,760
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	104.85	104.85	$91.64	$9,609	0.087	$836
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.087	$1,391
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2052	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.082	$492
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.082	$39,360
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	104.85	104.85	$93.94	$9,849	0.082	$808
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.082	$1,311
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2053	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.077	$462
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.077	$36,960
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	104.85	104.85	$96.28	$10,095	0.077	$777
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.077	$1,231
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2054	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.073	$438
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.073	$35,040
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	104.85	104.85	$98.69	$10,348	0.073	$755
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.073	$1,167
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2055	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.069	$414
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.069	$33,120
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	104.85	104.85	$101.16	$10,606	0.069	$732
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.069	$1,103
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2056	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.065	$390
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.065	$31,200
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	104.85	104.85	$103.69	$10,872	0.065	$707
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.065	$1,039
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							

	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2057	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.061	$366
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.061	$29,280
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	104.85	104.85	$106.28	$11,143	0.061	$680
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.061	$975
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
2058	Passive-use value associated with increases in forest biodiversity	Acre of additional forest habitat	0	50	50	$120	$6,000	0.058	$348
	Passive-use value associated with increases in salmon populations	Additional fish	0	240	240	$2,000	$480,000	0.058	$27,840
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	104.85	104.85	$108.94	$11,422	0.058	$662
	Avoided cost of sediment deposition	Tons of sediment	0	1,417	1,417	$11.28	$15,984	0.058	$927
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Avoided costs of regulatory enforcement	Unquantifiable (See Narrative Text)							
	Increased quality of recreation	Unquantifiable (See Narrative Text)							
Project Life								…	
								Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (i) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries	**$6,386,629**
Comments: See narrative description in Attachment 8 for a description of these benefits.									

(1) Complete these columns if dollar value is being claimed for the benefit.

Table 16 - Water Quality and Other Expected Benefits

(All benefits should be in 2009 dollars)

Project: 358--Mendocino Headwaters Integrated Water Management Plan, Mendocino County RCD

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit $ Value (1)	(h) Annual $ Value (f) x (g) (1)	(i) Discount Factor (1)	(j) Discounted Benefits (h) x (i) (1)
2009	No benefit				0		$0	1.000	$0
2010	No benefit				0		$0	0.943	$0
2011	No benefit				0		$0	0.890	$0
2012	No benefit				0		$0	0.840	$0
2013	Avoided costs of sediment deposition	Tons of sediment removed	0	643.9	643.9	$11	$7,263	0.792	$5,752
2014	Avoided costs of sediment deposition	Tons of sediment removed	0	643.9	643.9	$11	$7,263	0.747	$5,426
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.747	$179
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2015	Avoided costs of sediment deposition	Tons of sediment removed	0	643.9	643.9	$11	$7,263	0.705	$5,121
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.705	$169
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2016	Avoided costs of sediment deposition	Tons of sediment removed	0	643.9	643.9	$11	$7,263	0.665	$4,830
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.665	$160
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2017	Avoided costs of sediment deposition	Tons of sediment removed	0	643.9	643.9	$11	$7,263	0.627	$4,554
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.627	$150
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2018	Avoided costs of sediment deposition	Tons of sediment removed	0	643.9	643.9	$11	$7,263	0.592	$4,300
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.592	$142
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2019	Avoided costs of sediment deposition	Tons of sediment removed	0	643.9	643.9	$11	$7,263	0.558	$4,053
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.558	$134
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							

	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2020	Avoided costs of sediment deposition	Tons of sediment removed	0	643.9	643.9	$11	$7,263	0.527	$3,828
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.527	$126
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2021	Avoided costs of sediment deposition	Tons of sediment removed	0	643.9	643.9	$11	$7,263	0.497	$3,610
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.497	$119
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2022	Avoided costs of sediment deposition	Tons of sediment removed	0	643.9	643.9	$11	$7,263	0.469	$3,406
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.469	$113
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2023	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.442	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.442	$106
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2024	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.417	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.417	$100
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2025	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.394	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.394	$95
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2026	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.371	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.371	$89
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							

	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2027	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.350	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.350	$84
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2028	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.331	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.331	$79
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2029	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.312	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.312	$75
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2030	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.294	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.294	$71
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2031	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.278	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.278	$67
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2032	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.262	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.262	$63
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2033	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.247	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.247	$59
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							

2034	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.233	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.233	$56
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2035	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.220	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.220	$53
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2036	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.207	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.207	$50
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2037	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.196	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.196	$47
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2038	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.185	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.185	$44
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2039	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.174	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.174	$42
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2040	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.164	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.164	$39
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2041	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.155	$0

	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.155	$37
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2042	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.146	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.146	$35
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2043	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.138	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.138	$33
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2044	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.130	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.130	$31
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2045	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.123	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.123	$30
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2046	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.116	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.116	$28
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2047	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.109	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.109	$26
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2048	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.103	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							

	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.103	$25
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2049	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.097	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.097	$23
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2050	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.092	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.092	$22
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2051	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.087	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.087	$21
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2052	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.082	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.082	$20
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2053	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.077	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.077	$18
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2054	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.073	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.073	$18
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2055	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.069	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.069	$17

	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2056	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.065	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.065	$16
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2057	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.061	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.061	$15
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
2058	Avoided costs of sediment deposition	Tons of sediment removed	0	0	0	$11	$0	0.058	$0
	Reduced operations and maintenance costs	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in forest biodiversity	Acre of additional riparian habitat	0	2	2	$120	$240	0.058	$14
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultual value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in forest biodiversity	Unquantifiable (See Narrative Text)							
Project Life									
								Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries	**$47,818**
Comments: See narrative description in Attachment 8 for a description of these benefits.									

(1) Complete these columns if dollar value is being claimed for the benefit.

Table 16 - Water Quality and Other Expected Benefits

(All benefits should be in 2009 dollars)

Project: 441--Waterfall Gulch Transmission Main, City of Fort Bragg

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit $ Value [1]	(h) Annual $ Value (f) x (g) [1]	(i) Discount Factor [1]	(j) Discounted Benefits (h) x (i) [1]
2009	No benefit				0		$0	1.000	$0
2010	No benefit				0		$0	0.943	$0
2011	No benefit				0		$0	0.890	$0
2012	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2013	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2014	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2015	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2016	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2017	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2018	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2019	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2020	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							

	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2021	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2022	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2023	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2024	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2025	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2026	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2027	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2028	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2029	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2030	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							

2031	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2032	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2033	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2034	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2035	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2036	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2037	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2038	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2039	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2040	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2041	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							

	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2042	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2043	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2044	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2045	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2046	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2047	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2048	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2049	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2050	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2051	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							

2052	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2053	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2054	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2055	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2056	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2057	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
2058	Potential increased quality of drinking water	Unquantifiable (see Narrative Text)							
	Avoided costs associated with reduction in sedmient	Unquantifiable (see Narrative Text)							
	Passive use values associated with increased spawning habitat	Unquantifiable (see Narrative Text)							
	Cultural value associated with increased salmon populations	Unquantifiable (see Narrative Text)							
Project Life								...	
								Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries	
Comments: See narrative description in Attachment 8 for a description of these benefits.									

(1) Complete these columns if dollar value is being claimed for the benefit.

Table 16 - Water Quality and Other Expected Benefits

(All benefits should be in 2009 dollars)

Project: 362 --Blue Lake Fieldbrook Pipeline Support Retrofit, Humboldt Bay Municipal Water District

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit $ Value (1)	(h) Annual $ Value (f) x (g) (1)	(i) Discount Factor (1)	(j) Discounted Benefits (h) x (i) (1)
2009	No benefit				0		$0	1.000	$0
2010	No benefit				0		$0	0.943	$0
2011	No benefit				0		$0	0.890	$0
2012	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.840	$80,574
2013	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.792	$75,970
2014	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.747	$71,654
2015	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.705	$67,625
2016	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.665	$63,788
2017	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.627	$60,143
2018	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.592	$56,786
2019	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.558	$53,524
2020	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.527	$50,551
2021	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.497	$47,673
2022	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.469	$44,987
2023	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.442	$42,398
2024	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.417	$39,999
2025	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.394	$37,793
2026	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.371	$35,587
2027	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.350	$33,573
2028	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.331	$31,750
2029	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.312	$29,928
2030	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.294	$28,201
2031	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.278	$26,666
2032	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.262	$25,132
2033	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.247	$23,693
2034	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.233	$22,350
2035	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.220	$21,103
2036	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.207	$19,856
2037	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.196	$18,801
2038	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.185	$17,746
2039	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.174	$16,690
2040	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.164	$15,731
2041	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.155	$14,868
2042	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.146	$14,005
2043	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.138	$13,237
2044	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.130	$12,470
2045	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.123	$11,798
2046	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.116	$11,127
2047	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.109	$10,455
2048	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.103	$9,880
2049	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.097	$9,304
2050	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.092	$8,825
2051	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.087	$8,345
2052	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.082	$7,866
2053	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.077	$7,386
2054	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.073	$7,002
2055	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.069	$6,619
2056	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.065	$6,235
2057	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.061	$5,851
2058	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.058	$5,563
2059	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.054	$5,180
2060	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.051	$4,892
2061	Avoided damage from fire	Value of damage	0	95,922	95,922	$1	$95,922	0.048	$4,604
Project Life								...	
								Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (i) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries	$1,345,786

Comments: See narrative description in Attachment 8 for a description of these benefits.

(1) Complete these columns if dollar value is being claimed for the benefit.

Table 16 - Water Quality and Other Expected Benefits

(All benefits should be in 2009 dollars)

Project: 405--Sustainable Forests, Clean Water and Carbon Sequestration Demonstration Project, Redwood Forest Foundation, Inc)

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit $ Value [1]	(h) Annual $ Value (f) x (g) [1]	(i) Discount Factor [1]	(j) Discounted Benefits (h) x (i) [1]
2009	No benefit								
2010	No benefit								
2011	No benefit								
2012	No benefit								
2013	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	562.5	562.5	$35.86	$20,171	0.792	$15,976
	Improved soil quality	Tons of biochar sold	0	187.5	187.5	$2,000	$375,000	0.792	$297,000
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2014	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Avoided cost of carbon dioxide emissions	Tons of carbon dioxide	0	562.5	562.5	$36.76	$20,678	0.747	$15,446
	Improved soil quality	Tons of biochar sold	0	187.5	187.5	$2,000	$375,000	0.747	$280,125
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2015	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2016	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2017	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2018	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2019	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2020	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							

	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2021	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2022	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2023	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2024	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2025	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2026	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2027	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2028	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							

	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2029	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2030	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2031	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2032	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2033	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2034	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2035	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							

	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2036	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2037	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2038	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2039	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2040	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2041	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2042	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2043	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							

	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2044	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2045	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2046	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2047	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2048	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2049	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2050	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							

	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2051	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2052	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2053	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2054	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2055	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2056	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2057	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
2058	Passive-use value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							

	Cultural value assocaited with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Value of decrase in likelihood of catastrophic fire event	Unquantifiable (See Narrative Text)							
	Cultural value derived from access to acorn harvesting orchard	Unquantifiable (See Narrative Text)							
Project Life								…	
								Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries	**$608,547**
Comments: See narrative description in Attachment 8 for a description of these benefits.									

(1) Complete these columns if dollar value is being claimed for the benefit.

Table 16 - Water Quality and Other Expected Benefits

(All benefits should be in 2009 dollars)

Project: 357--Willow Creek Stormceptor, Willow Creek Community Service District

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit $ Value (1)	(h) Annual $ Value (f) x (g) (1)	(i) Discount Factor (1)	(j) Discounted Benefits (h) x (i) (1)
2009	No benefit				0		$0	1.000	$0
2010	No benefit				0		$0	0.943	$0
2011	No benefit				0		$0	0.890	$0
2012	Avoided replacement costs	Cost of system replacement			0		$0	0.840	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2013	Avoided replacement costs	Cost of system replacement			0		$0	0.792	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2014	Avoided replacement costs	Cost of system replacement			0		$0	0.747	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2015	Avoided replacement costs	Cost of system replacement			0		$0	0.705	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2016	Avoided replacement costs	Cost of system replacement			0		$0	0.665	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2017	Avoided replacement costs	Cost of system replacement			0		$0	0.627	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2018	Avoided replacement costs	Cost of system replacement			0		$0	0.592	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2019	Avoided replacement costs	Cost of system replacement			0		$0	0.558	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2020	Avoided replacement costs	Cost of system replacement			0		$0	0.527	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2021	Avoided replacement costs	Cost of system replacement			0		$0	0.497	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2022	Avoided replacement costs	Cost of system replacement			0		$0	0.469	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2023	Avoided replacement costs	Cost of system replacement	0	1	1	$1,350,000	$1,350,000	0.442	$596,700

	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2024	Avoided replacement costs	Cost of system replacement			0		$0	0.417	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2025	Avoided replacement costs	Cost of system replacement			0		$0	0.394	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2026	Avoided replacement costs	Cost of system replacement			0		$0	0.371	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2027	Avoided replacement costs	Cost of system replacement			0		$0	0.350	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2028	Avoided replacement costs	Cost of system replacement	1	0	-1	$1,350,000	-$1,350,000	0.331	-$446,850
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2029	Avoided replacement costs	Cost of system replacement			0		$0	0.312	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2030	Avoided replacement costs	Cost of system replacement			0		$0	0.294	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2031	Avoided replacement costs	Cost of system replacement			0		$0	0.278	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2032	Avoided replacement costs	Cost of system replacement			0		$0	0.262	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2033	Avoided replacement costs	Cost of system replacement			0		$0	0.247	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2034	Avoided replacement costs	Cost of system replacement			0		$0	0.233	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2035	Avoided replacement costs	Cost of system replacement			0		$0	0.220	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2036	Avoided replacement costs	Cost of system replacement			0		$0	0.207	$0

	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2037	Avoided replacement costs	Cost of system replacement			0		$0	0.196	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2038	Avoided replacement costs	Cost of system replacement			0		$0	0.185	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2039	Avoided replacement costs	Cost of system replacement			0		$0	0.174	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2040	Avoided replacement costs	Cost of system replacement			0		$0	0.164	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2041	Avoided replacement costs	Cost of system replacement			0		$0	0.155	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2042	Avoided replacement costs	Cost of system replacement			0		$0	0.146	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2043	Avoided replacement costs	Cost of system replacement			0		$0	0.138	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2044	Avoided replacement costs	Cost of system replacement			0		$0	0.130	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2045	Avoided replacement costs	Cost of system replacement			0		$0	0.123	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2046	Avoided replacement costs	Cost of system replacement			0		$0	0.116	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2047	Avoided replacement costs	Cost of system replacement			0		$0	0.109	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2048	Avoided replacement costs	Cost of system replacement			0		$0	0.103	$0
	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
	Passive-use value associated with increases in salmon populations	Unquantifiable (See Narrative Text)							
	Cultural value associated with increases in salmon population	Unquantifiable (See Narrative Text)							
2049	Avoided replacement costs	Cost of system replacement			0		$0	0.097	$0

	Avoided costs of sediment deposition	Unquantifiable (See Narrative Text)							
Project Life									
								Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (i) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries	**$149,850**
Comments: See narrative description in Attachment 8 for a description of these benefits.									

(1) Complete these columns if dollar value is being claimed for the benefit.